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CONTENTS

	PAGE
Editorial Notes	141
Mr. Brebner on Public Relations & Publicity	143
Expansion in Long Rails	144
London—Paris Services	144
Eire to Nationalise Transport	147
Letters to the Editor	148
The Scrap Heap	150
Overseas Railway Affairs	151
Major Developments in Locomotive Design	152
Heavy Bridge Reconstruction in U.S.A.	153
Long Rails in South Africa	154
Ocean Train-Ferry Pier on 200-ft. Piles	155
Personal	159
Ministry of Transport Accident Report	161
Problems of Nationalisation in Argentina	164
Parliamentary Notes	164
Notes and News	166

BRITISH TRANSPORT DIRECTORY OF OFFICIALS

*A revised list of members of the Ministry of Transport, the British Transport Commission, and its Executives is now obtainable from the Publishers, "The Railway Gazette," 33, Tothill Street, Westminster, S.W.*1. *Price* 1*s.*

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THE RAILWAY GAZETTE

33, TOTHILL STREET, WESTMINSTER, S.W.1

Road and Rail Charges Policy?

WHEN Mr. L. J. Callaghan, Parliamentary Secretary to the Ministry of Transport, spoke at a Streatham Labour Party meeting on February 3, he made a remark which has attracted singularly little attention in view of its implications. Mr. Callaghan was questioned about the difference in fares between buses and trains. In reply, he said that it was more expensive to run trains, and they had been running at a loss for many years. The losses from the trains could be made up by the profits on the buses and he would like to see road services developed more fully, for the more that was done the more profit would be available to make up for not-so-profitable train services. Primarily, no doubt, Mr. Callaghan had in mind the services of the former London Passenger Transport Board. If the policy were extended to cover main-line railway and road services, it would have its effect on the charges schemes which are now being considered. It is an important factor in rate-making policy, and as such any elucidation by the Ministry of its view would be welcome.

* * * *

Railway Staff Reductions

In our December 31 issue we mentioned that reductions in railway staff might soon be decided on. Since that time several newspapers have referred to the impending dismissal of some 25,000 railway employees. It by no means follows that the decision of the Railway Executive to reduce staff will be effected by large-scale dismissals. It is desired to reduce the staff by 26,000 by about the end of March. Arrangements have been made for recruitment to be slowed down, so that normal wastage, which occurs because of retirement, resignation, deaths, and ordinary dismissals, may be used as far as practicable for reducing numbers in the first instance. After that, temporary staff and women employed in posts normally occupied by men will be dispensed with; consideration is also being given to the early retirement of suitably aged staff. It is only in cases where measures of this kind do not secure the desired economy in numbers that it may become necessary to dismiss regular staff. The position has been discussed at some length with the trade unions.

* * * *

Civil Engineering in Scottish Region

The re-organisation of the Scottish Region of British Railways has been taken a stage further by the unification and organisation of the Civil Engineer's Department into seven Districts. These cover the same territory as the respective Commercial and Operating Districts, the principal difference being that the Glasgow Civil Engineering Districts will include two routes which are not embraced in the Glasgow "Traffic" District—the West Highland Line of the former L.N.E.R. and the former L.M.S.R. West Coast main-line from Carstairs to Gretna Junction. The West Highland Line will be included in the Glasgow Northern Engineering District, and the Glasgow Central—Gretna Junction main line in the Glasgow Southern Engineering District. The District Engineers appointed to take charge of the new Districts are as follow: Inverness, Mr. A. McIntosh; Aberdeen, Mr. T. W. Brown; Perth, Mr. W. Russell; Irvine, Mr. J. B. Halley; Edinburgh, Mr. J. Scott; Glasgow North, Mr. C. B. Glenesk; and Glasgow South, Mr. W. Paterson. The re-organisation of the existing ten Engineering Districts into the seven Districts will be effected gradually.

* * * *

Municipalisation *v.* Nationalisation

There are growing indications that the Government may find its policy of bus nationalisation under area schemes is involving it in deep waters with many of its electoral supporters, by reason of the proposals to take over municipally-owned transport. As we have already pointed out, the great conflict some 40-50 years ago was between municipal and private trading, and many bus systems of the large provincial towns are in the hands of the municipalities, which often secure therefrom satisfactory profits for the relief of the rates. Thus, many supporters of socialist views feel that public ownership has already been achieved in a satisfactory way,

and are far from giving their support to any measure of centralisation which will divert both local profits and the control of undertakings from local interest. When the Committee (or "working party") of the Road Transport Executive which is examining the North-Eastern Area Scheme was first appointed, it included Mr. A. T. Evans, Director & General Manager of the United Automobile Services Limited, which is a B.T.C. subsidiary, and a strong protest was made by the 8 municipal authorities of Newcastle, South Shields, Sunderland, West Hartlepool, Stockton, Darlington, Middlesbrough, and the Teesside Rail-less Traction Board. As a result of representations (believed to have gone as far as the Minister of Transport), Mr. Evans was replaced by Mr. A. Henderson, a full-time Member of the Road Transport Executive, and former Regional Transport Commissioner for Scotland. The proceedings of this Committee have not taken place in public, but it is believed that municipal representations have been critical of the proposals.

* * * *

Great Northern Railway (Ireland) Company

The report for the year ended December 31, 1948, shows an increase of £242,423 in gross railway receipts, offset by a rise in expenditure of £355,181. The total net income of the year decreased by £171,455 and amounted to £93,666. After deduction of fixed charges, a deficit of £72,454 results. Adjustments for taxation and the addition of the balance brought forward, yield a balance of £42,558 available for dividends, and the directors recommend the payment on March 15 of a dividend, less income tax, of £4 per cent. on the consolidated 4 per cent. guaranteed stock. Passenger receipts were £1,404,938 (compared with £1,267,876 in 1947) and goods receipts £1,226,638 (£1,132,262 in 1947). Increased expenses of locomotive running, traffic, and of maintenance and renewal of rolling stock together accounted for the greater part of the increased total expenditure. Details are tabulated below:—

	1947	1948
No. of passengers	8,184,350	7,731,862
Passenger receipts	£1,267,876	£1,404,938
Goods tonnage	1,525,126	1,508,826
Goods receipts	£1,132,262	£1,226,638
Total gross receipts, incl. road transport, hotels, etc.	£3,411,843	£3,728,931
Expenditure	£3,219,991	£3,699,593
Net receipts	£191,852	£29,338

* * * *

Road Haulage Nationalisation Progress

The Road Transport Executive continued last year to progress with the voluntary acquisition of various haulage undertakings designed to form the nucleus of its organisation. During December, 29 businesses were acquired, bringing the total up to 200, of which 32 rank as primary (or holding) companies. This was the position, therefore, at the end of the first year of nationalisation, and the R.T.E. has announced that, at January 1, between 450 and 500 notices of compulsory acquisition had been served on freight road transport undertakings in accordance with the provisions of Part III of the Transport Act, 1947. The first compulsory acquisition by by the R.T.E. took place at midnight on December 31, 1948, and involved the taking over of Tuckers Transport Limited of Cardiff with 24 vehicles. Since that time, compulsory acquisitions have been completed from day to day, but the numerical result will not be known until the *Gazetteer of Undertakings Acquired*, No. 5, to January 31 becomes available. Senior staff appointments to the divisional organisation are being made, so far as possible from among existing road transport officials. The divisions are being sub-divided into districts, usually five (mostly with at least a thousand vehicles), and then into groups of approximately 120 vehicles.

* * * *

Minority Bus Shareholdings

As the list published in our January 7 issue (page 25) showed, the bus interests of the British Transport Commission at present may be grouped into three classes, namely, those in which the B.T.C. holds all the issued share capital; those in which it holds a controlling interest; and those in which it holds a substantial but minority interest inherited from the main-line railways. It is in regard to the second class that the minority shareholders are in an invidious position. They are mainly shareholders in Tilling Group companies, and Sir Frederick Heaton has suggested, in a letter to *The Financial Times*, that in equity they should be offered terms similar to those made to Thomas Tilling Limited. The principal companies in which minority holdings are still quoted on the stock exchange are the Bristol Tramways & Carriage Co. Ltd., Hants & Dorset Motor Services Limited, the National Omnibus & Transport Co. Ltd., and Tilling Motor Services Limited. Other cases with substantial outstanding minorities are Cumberland Motor Services Limited, and, to a smaller extent, the United Counties Omnibus Co. Ltd., and the Westcliff-on-Sea Motor Services Limited. It is noteworthy that the S.M.T. deal makes full provision for the minority holdings.

* * * *

The British Adoption of F.B. Rails

The decision of the Railway Executive to adopt flat-bottom rail as standard, instead of the traditional British bull-head rail, which we recorded last week, is open to some misconception on the part, not only of the general public, but also by non-engineering railwaymen. The official announcement made the point that flat-bottom rail had become almost universal in every country but Great Britain, and thus made possible the implication that we were at last coming into line with the technical improvements of the rest of the world. This might be regarded as inconsistent with the reiterated assurance that, on the outbreak of war in 1939, our track was second to none, as indeed its extraordinarily efficient service during that war under arduous conditions of traffic not previously envisaged had demonstrated adequately. It should be made clear that what the British Railways are adopting is not the flat-bottom rail with very broad base, spiked directly to closely-spaced hardwood timbers, which is the form of track used on the greater proportion of the world's railway mileage, but is a specialised development of flat-bottom track such as exists in other countries only on main lines carrying intensive traffic, having a substantial baseplate (instead of a chair) and a form of fastening which it is hoped will involve less maintenance than the fastenings of bull-head rail.

* * * *

Post-War Uses for Military Bridging Material

The honour of appointment as Chevalier of the Legion of Honour recently conferred on Lt.-Colonel W. T. Everall brings a reminder that the standard military railway bridging equipment, for which he was primarily responsible, has proved of great value to many countries, where it has been put to numerous post-war uses. When last year's floods on the Scottish border damaged so many bridges, there was an urgent call for such material, and over 2,000 tons of spans and trestling were used. For the rehabilitation of the railways of Poland, six 350-ft. Everall truss-type and numerous smaller spans were presented by Great Britain to the Poles. Some of them were erected as what *The Times* described as the "Everall Bridge," carrying the railway over the Eastern Oder at Szezcin (pre-war Stettin), opened just a year ago in the presence of the British Ambassador. Large numbers of these spans; varying in length from 80 ft. to 100 ft., may also be found in Greece, some 30 spans are in China, and many others in Italy, Belgium, and France, in all of which countries they have proved invaluable in helping to restore rail communications. In Holland, too, large quantities of this material were useful for rebuilding big railway bridges, including the Deventer Bridge and a portion of the Arnhem Bridge.

* * * *

Standard Military Trestles

The various types of standard military trestles have been put to an even greater variety of post-war uses than the bridge spans. For example, they proved most useful in the construction of the Brabazon assembly hall for the Brabazon aircraft (described in a recent paper by Mr. C. B. Colquhoun before the Institution of Civil Engineers). There they were used as temporary supports for the erection of the 345-ft.-span ribs, 70 ft. in height, and for the 60-ft. towers of the erection cranes for building out the ribs from their supports. In fact, these trestles are to be found all over the world, put to all manner

of uses. Incidentally, as Colonel Everall's French honour is ostensibly awarded in recognition of his work in connection with the Arromanches artificial harbour steelwork, it may be mentioned that no fewer than 180 of the Mulberry flexible bridge spans have been used to rebuild many road bridges in different parts of France, and, in aggregate, have provided three miles of bridging. The special equipment designed by Colonel Everall to enable train-ferry vessels to unload locomotives and rolling stock at different Continental ports damaged during the war has also proved a boon in the restoration of rail services.

* * * *

Ocean Train-Ferry and Pier

In this country we are familiar with train ferries carrying railway vehicles across 60 or 100 miles of salt water, but in America, ferries on a far larger scale often are necessary, not only on the lakes, but for ocean-going purposes. Seatrain Lines Incorporated now operates specially-designed steamers each carrying about 100 high-capacity freight cars, between New York, New Orleans, and Texas City, a mere 2,000-mile ocean route! The cars are transhipped from pier to steamer and *vice versa* by a double-cantilever gantry-type crane—overhanging vessels berthed at each side of the pier—and are stowed away on the four decks of the steamers. There are several interesting features in the design and methods of construction of the pier and transhipment crane at New York, described elsewhere in this issue. Two, however, appear to be open to some criticism, namely, the extremely scanty diagonal bracing for such long piles, especially in the longitudinal direction, and the lack of any protection for about 200 of these H-section steel piles, from sea water and salt-laden air. The remaining piles are encased in concrete down to 3 ft. below mean low-water level.

* * * *

A Bridge Pier of Unusual Design

In order to renew the substructure of a long bridge under traffic, the Louisville & Nashville Railroad engineers recently designed a type of pier which could be built by driving piles alongside, though not under, the existing girder spans. As described in detail elsewhere in this issue, each new pier has been constructed midway between two old ones. It consists of two clusters with a clear space of 22 ft. between the tops of the nearest piles in each cluster, and a heavy reinforced concrete slab measuring 34 ft. 6 in. × 13 ft. 6 in. × 5 ft. 4 in. thick acting as a capping girder between the clusters. In each cluster there are eight piles about 80 ft. long, driven as 24-in. dia. steel Armco cylinders ½ in. thick, and subsequently filled with reinforced concrete. All the piles have an outward batter, so that each cluster has an effective base of about 32 ft. × 26 ft. and, consequently, is in itself, a strong and stable tower. With two such clusters tied together by so heavy a cap, and with at least 60 per cent. of the piles embedded in the river bed, an amply rigid pier for a single-line bridge would seem to be provided, despite the lack of underwater bracing between the clusters.

* * * *

A High Rail Joint

Lt.-Colonel G. R. S. Wilson's report on the derailment at New Southgate on July 17, 1948, a summary of which appears in this issue, shows that a high rail joint in the Barnet tunnel led to the rear bogie wheels of the engine leaving the rails, when the train was travelling at about 70 m.p.h. The trouble was realised by the engine crew as they emerged from the tunnel and the brakes were fully applied at once. Had the track been without any connections, the consequences probably would not have been very serious, but, unfortunately, the leading wheels were thrown off by contact between a V-crossing and the derailed bogie. This tore up the track and complete derailment of the train followed. The high rail joint had been the result of what Colonel Wilson describes as a "surprising error of judgment" on the part of the ganger, a most experienced man, whose work was spoken highly of by the railway officers. As often happens in these cases, more than one fault had to coincide in their effects to cause the wheels to leave the rails, in combination with a speed that was higher than the driver estimated.

Mr. Brebner on Public Relations & Publicity

DURING and since the war a good deal of interest has been aroused by the widespread introduction of public relations into Government and business organisations. The recent increase in the nationalisation of industries has tended to make greater both the numbers and the importance of those engaged in the public relations and publicity fields. There is, however, still a conspicuous lack of knowledge and understanding of the functions and objectives inherent in public relations and publicity, particularly, perhaps, in certain ranks of personnel engaged in large-scale industry such as transport. At the invitation of the Institute of Public Administration, Mr. J. H. Brebner, Chief Public Relations & Publicity Officer of the British Transport Commission, has written a booklet* which should do much towards making clear what is entailed in public relations and publicity. Mr. Brebner is well qualified for the task he has undertaken, for he has given twenty years of service to the subject of his booklet.

He suggests that the simplest definition of public relations and publicity in modern administration is that they are concerned with the study of the human factor in industry, and to an increasing degree in Government. Public relations and publicity begin as an attitude of mind; a way of regarding and approaching other people. The headmaster in his management of tiresome parents and mischievous boys; the politician answering questions of his constituents; the company chairman recommending unpopular measures to a worried board; each is tackling in his own walk of life a situation calling for the sensitiveness and skill that is associated with successful public relations and publicity. When the listening and explaining have to be done on behalf of the large organised group in business or Government, it can be dealt with effectively only by specialists. The more powerful a group, the more important it is that its public relations should be well managed, and the more difficult it becomes to manage them well.

The author explains why he uses the terms "public relations and publicity" by saying that they are a single function having two aspects. The fundamental difference between public relations and publicity is in the technique of their approach. Broadly, the first deals with the individual and the second with people in the mass. Whether a single department is responsible for the whole of the work, or whether two separate organisations are used, it is essential that at the top there should be unity in control, so that there should be no divergence between the policy of the public relations and publicity effort.

It is perhaps this matter of high-level control which may be most subject to controversy in large-scale industrial organisations such as transport. What is the highest effective level to be from the point of view of a public relations organisation? For example, is public relations a functional matter? If so, it would seem that each of the Executives should have its own public relations organisation, as, indeed, most of them have. The apex of this organisation would be in the Chairman of the particular Executive. It might be argued equally that public relations in transport must be concerned with the policy rather than management—that its objective is the furtherance of transport as a whole, rather than its individual branches. In this case its apex must be the Chairman of the British Transport Commission.

There may be a third way. Publicity and public relations may be deemed functional in so far as they relate to specific services, are designed to attract traffic to those services, or explain points arising in connection with them. In that case they would be part of the functional duties of each Executive. Matters appertaining to transport policy as a whole would vest in the Commission, and co-ordination between the Commission and Executives would be necessary to ensure that neither overlapping nor divergence of policy, even by implication, took place. Possibly something of this sort is favoured by Mr. Brebner, for in his booklet he says: "In the organisation to which I belong, the British Transport Commission, the Chief Public Relations & Publicity Officer reports direct to the Chairman. The same is generally true of the five Executives, to which the operation and management of the nationalised

* "Public Relations and Publicity," by J. H. Brebner. Published for the Institute of Public Administration by the National Council of Social Service. Price 2s.

transport undertakings have been largely delegated." So far as the British Transport Commission is concerned, the practice is for the Chief Public Relations & Publicity Officer to deal with public relations at headquarters level and also to co-ordinate and supervise this work throughout the whole of the undertaking.

He also points out, however, that the public relations and publicity function can never be specifically linked with the conduct of the day-to-day business delegated to a sectional Executive. In so far as the work involved is executive, it is itself a delegation of responsibility on the part of the head, but the responsibility is central as distinct from those of sectional or departmental executives. According to Mr. Brebner: "The head of a commercial or technical section or department is responsible for his particular commercial or technical side of the business only. The public relations and publicity expert within his own field of interpretation and explanation is responsible for everything."

* * * *

Expansion in Long Rails

TO many railwaymen not directly associated with the Civil Engineering Department, and thus not familiar with the behaviour of anchored ferrous structures, the expansion and contraction in long rails, resulting from temperature changes, remains a matter on which they have but a vague impression of the principle involved. Any rail a mile long, subjected to a temperature variation of 75° F. above and below the temperature at which the rail was laid, would increase its length by expansion (or decrease by contraction) to the extent of 15⅝ in. at each end if it were free. As such a rail is fixed by means of the resistance of the fishplates, sleeper fastenings, and sleepers themselves embedded in the ballast, a total force of about 61·3 tons (137,800 lb.) is brought into play for a 96-lb. rail, and the tendency to push the rail ends away from the centre of the rail is resisted, and contained within the rail in the form of compressive stress (or with the tendency to contraction, tensile stress). The fishplates at the end of a long 96-lb. rail are considered to offer a resistance of about 30,000 lb., and, providing the sleeper fastenings have a sufficient grip, or are reinforced by anchors, the average resistance of a sleeper is about 500 lb. per rail. Up to 230 sleepers at each end of the section may be anchored, and the total resistance of these sleepers at the end of a rail would therefore be about 145,000 lb., which is ample to control the expansion and contraction of the rail due to the wide temperature variation mentioned, and is in excess of anything encountered in temperate climates, and has still an adequate safety margin for tropical countries. According to the calculations of the American Railway Engineering Association, the prevention of a rail from expanding or contracting causes an internal stress of 195 lb. per sq. in. for each 1° F. change in temperature. Thus, a change in temperature of 100° F. would create an internal stress in the rail of 19,500 lb. or 8·75 tons per sq. in.

To minimise these high internal stresses, it is customary to lay long rails at the mean average annual temperature, and thus reduce the tendency of the rail to buckle, if the fastenings should become weakened. One of the great difficulties with long rails, apart from the practical limitations provided by transport, is that the opening up of the track can be done only at approximately the same temperature as that at which the rail was laid. This places severe limitations on a maintenance programme, and can become even more serious in the event of a rail fracture, when it is necessary to remove the defective section. It is for this reason, undoubtedly, that use of very long welded rails has not spread more rapidly. The compressive force which is locked up in the rails must be considered from the point of view of its effect on the lateral stability of the track. At one time, there was thought to be a serious danger of buckling or lateral distortion at high temperature, but calculations which have been made, and experience gained in actual service, tend to indicate that, providing reasonably good standards of ballasting and general track maintenance are observed, and the track is laid originally, or subsequently regulated, at the mean temperature, no apprehension need be felt on this score. Under such conditions, long welded track may be even more stable than short rail track, for rail creep may lead to the joints closing up; cases of buckling due to this cause are not uncommon in track laid with 45-ft. or 60-ft. rails.

One extensive user of very long rails is London Transport, and, on the open line sections of the London Transport railways, an ingenious form of sliding expansion joint at the ends of the long sections has been adopted. This expansion joint, which was described and illustrated in our issue of June 27, 1947, enables the keys to be knocked out, and any tendency towards expansion or contraction which may be imprisoned in the rail can exhaust itself at each end before further operations are begun. Also, such joints enable an adjustment to the mean average temperature to be made at a period subsequent to the laying, if the programme demands initial laying at a time when the temperature is higher or lower than the average.

* * * *

London—Paris Services

ALTHOUGH no reference was made in the recent series of articles on "Shorter Trains and More of Them" to the present very restricted and heavily-loaded Continental trains from London, a strong case undoubtedly exists here for a spread-over of the traffic by the running of more services, with less delay and inconvenience to passengers at the ports. Unfortunately, shipping shortage, and customs, passport, and currency formalities make improvement a very difficult matter, and until what we are told was Mr. Bevin's "foreign policy" in 1946—"to go down to Victoria Station and go where the hell I like without a passport or anything else"—becomes an accomplished fact, little change seems likely. None the less, it may be interesting to review very briefly the old Continental services, compared with what is offered to us today.

Before the "working union" of the South Eastern and London Chatham & Dover railways in 1899, there was an amazing choice of services to the Continent. In the summer of 1896, for example, there were departures from Charing Cross at 9 and 11 a.m. for Dover, serving Cannon Street, and reaching Paris in 7¼ and 8 hr., and at 10 a.m. for Folkestone (7 hr. 40 min. to Paris) with a Dover portion (for Ostend) detached at what is now Folkestone Junction. There was a night service from Charing Cross at 9 p.m. for Paris, also serving Cannon Street, and an afternoon Ostend service ran to Dover at 5.35 p.m. From Victoria the London Chatham & Dover ran boat trains to Dover at 9 and 11 a.m. and 9 p.m. for Paris and at 10 a.m. for Ostend, as well as the 8.30 p.m. Queenboro' and Flushing boat train, all with connections from Holborn Viaduct picked up at Herne Hill, and there were 10 a.m. and 9.45 p.m. departures from Victoria "West End" (as the Brighton company styled this terminus) *via* Newhaven and Dieppe, taking 9 and 10 hr. to Paris St. Lazare, as well as a 9.35 p.m. from Waterloo *via* Southampton and Havre—"the old favourite and picturesque Normandy route" the advertisements called it—which brought its passengers into Paris at 11.30 a.m.

Even this lavish service had been supplemented early in the 'nineties by the Club Trains between London and Dover, which left Charing Cross and Victoria at 3 p.m. and were due in Paris at 10.47 on Chatham and 10.57 on South Eastern announcements. This was a first class only service, taking 105 min. non-stop from Charing Cross to Dover and 105 min. from Victoria with a stop at Herne Hill and a connection from Holborn Viaduct, and a 5s. supplement was charged between London and Dover over and above the express fare levied on all boat-train passengers, though this latter was only 1s. 6d. on the single journey, first or second class. The Club Train's return was at 3.15 p.m. from Paris Nord, arriving at both Charing Cross and Victoria at 10.45, and the Chatham company, which had run a Pullman, borrowed from the Brighton, between Victoria and Dover as early as 1882, announced it as formed of "special saloon cars." A somewhat similar service re-appeared in 1913 at 4.30 p.m., from Charing Cross only, as a 90 min. non-stop to Dover (first and second class), and in 1914 was accelerated to reach Paris in 6½ hr., but its return working was at 12.30 a.m. from Paris, due in London at 10.15 a.m.

The "working union" soon reduced the number of boat trains between London and Dover, and in 1912 there were departures from Charing Cross at 9 and 10 a.m., 2.20 and 9 p.m., with an 11 a.m. train from Victoria only, already a

popular and heavy service and a difficult proposition for the Wainwright engines, after the introduction of Pullmans in 1910. All the Cannon Street and Holborn Viaduct services had vanished, though the 10 a.m. from Charing Cross to Folkestone had a pick-up stop at Tonbridge for continental passengers, and a similar set-down stop was made by the 1.40 p.m. from Folkestone (8.25 from Paris) to Charing Cross. The day and night trains from Victoria *via* Newhaven and Dieppe still ran, as well as the Southampton and Havre service, leaving Waterloo at 9.45 p.m. and due in Paris at 11.22 a.m.

After the first world war came the concentration of the restored continental services at Victoria, with the Paris departures generally at 9 (Folkestone) and 11 a.m. (Dover), 2 (Dover), and 4.30 p.m. (Folkestone)—these are 1935 schedules, and there were various changes in the routing and departure times of the two last-named trains—with the Newhaven and Dieppe trains leaving at 10.5 a.m. and 8.20 p.m., and a 9 p.m. departure from Waterloo *via* Southampton and Havre, due in Paris at 9.49 a.m.

From May 15, 1927, to May 25, 1932, the L.M.S.R. provided a continental service *via* Tilbury and Dunkerque, but the boats —old vessels constructed in 1904 and 1909 for the Heysham and Fleetwood routes to Ireland—were not satisfactory, and conditions at St. Pancras and Tilbury did not make for success. The service, which carried mainly excursion traffic but got just enough patronage to annoy the older firms in the cross-channel business, originally left St. Pancras at 10.30 p.m. and was due in Paris Nord at 10.20 a.m. It returned at 8 p.m. from Paris, and reached St. Pancras at 8.9 a.m. On its cancellation, the Southern Railway operated the boats between Folkestone and Dunkerque, giving a departure from Victoria at 11 p.m. and a morning arrival at 7.35 (the Paris arrival was 10.4 a.m. and the departure 8.5 p.m.), and this service was continued, at varying times, until the commencement in October, 1937, of the Dover and Dunkerque night ferry, with through Wagons-Lits sleeping cars between London and Paris. The original departure was 10 p.m. from Victoria, due in Paris at 8.55 a.m., returning from the Gare du Nord at 9.50 p.m., reaching London at 8.30 a.m.

The "Golden Arrow" Pullman trains, which commenced to run in May, 1929, on a 6 hr. 35 min. schedule between London and Paris, can only be classed as an additional service during the brief period till May, 1931, when a special cross-channel boat (*Canterbury*) at a supplement of 10s. for each crossing was provided for "Arrow" passengers. Afterwards, passengers from the "Arrow" Pullman used the same boat as traffic from the ordinary train, and most of the privileges of the "Arrow" passengers necessarily vanished.

The last pre-war services, of May 15, 1939, comprised 9 a.m. and 4.30 p.m. departures from Victoria *via* Folkestone, 10.30 and 11 a.m. and 2 p.m. *via* Dover, the night ferry at 10 p.m., two Newhaven and Dieppe services at 10.5 a.m. and 8.20 p.m., and the usual 9 p.m. from Waterloo *via* Southampton and Havre. No other changes in the period between the two wars can be said to have affected travel conditions between London and Paris, as the Great Western Railway's continental services from Birmingham and the Midlands, developed after the opening of the Bicester route to Birmingham in 1910, merely brought passengers into Victoria to join existing continental trains, though it may be recalled that the London & North Western in 1897 had experimented with through carriages between Birmingham and Dover Pier, worked from Willesden over the West London and West London Extension, and attached to Chatham boat trains at Herne Hill.

Now that Great Britain has become—to borrow a *Daily Mail* phrase—a concentration camp, continental services from London (ignoring summertime and wintertime variations) consist of departures from Victoria at 9 and 9.30 a.m., for the "Golden Arrow" boat from Dover, 1.30 p.m. *via* Folkestone-Calais, and 9 p.m. for the night ferry from Dover to Dunkerque, with one train at 8.30 a.m. for the day Newhaven-Dieppe boat, and on Mondays only a 9 p.m. from Waterloo for Southampton-Havre. Actually, the journey times by the "Golden Arrow" compare quite favourably with 1929, as the Southern train runs between Victoria and Dover in 98 min. down and 95 min. up (this was 98 min. each way in 1929), and the Nord, between Calais and Paris, advertises 3 hr. 16 min. and 3 hr. 10 min., compared with 3 hr. 10 min. in both directions. But the transfer intervals at Dover and Calais are now 27 and 19 min. on the outward and 35 and 35 min. on the return journey, though *Invicta* does the crossing in 80 instead of the original *Canterbury* 75 min. sea schedule. Whether passengers who pay the "special" first class single "Arrow" fare of 136s. 6d. from London to Paris, or the 19s. 5d. supplement for "Arrow" travel charged on tickets for beyond Paris, can expect any mitigation of formalities is a matter of opinion, but we can at least hope that the present limitation of services is only temporary.

LONDON TO PARIS 1914

9 Services Daily

		a.m.	a.m.	a.m.	a.m.	p.m.	p.m.	p.m.	p.m.	p.m.
Charing Cross dep.		9.0	10.0	—	—	2.5	4.30	—	9.0	—
Victoria ... ,,		—	—	10.0	11.0	—	—	8.45	—	—
Waterloo ... ,,		—	—	—	—	—	—	—	—	10.30
Folkestone T. arr.		—	11.50	—	—	3.45	—	—	—	—
,, B. dep.		—	11.55	—	—	3.55	—	—	—	—
					p.m.					
Dover ... T. arr.		10.40	—	—	12.45	—	6.0	—	10.40	—
,, ... B. dep.		11.5	—	—	12.55	—	6.5	—	11.5	—
Newhaven ... T. arr.		—	—	11.22	—	—	—	10.15	—	—
,, ... B. dep.		—	—	11.30	—	—	—	10.25	—	—
										a.m.
Southampton B. dep.		—	—	—	—	—	—	—	—	12.30
		p.m.	p.m.	p.m.	p.m.	p.m.	p.m.	a.m.	a.m.	a.m.
Calais ... T. dep.		1.15	—	—	2.50	—	7.45	—	1.30	—
Boulogne ... ,,		—	2.10	—	—	6.2	—	—	—	—
Dieppe ... ,,		—	—	3.16	—	—	—	3.8	—	—
Havre ... ,,		—	—	—	—	—	—	—	—	8.0
Paris Nord T. arr.		4.40	5.20	—	6.20	9.0	11.0	—	5.40	—
,, St. Lazare ,,		—	—	5.59	—	—	—	6.3	—	11.22

1949—5 Services Daily and 1 Weekly

							M.O.
		a.m.	a.m.	a.m.	p.m.	p.m.	p.m.
Victoria ... dep.		8.30	9.0	9.30	1.30	9.0	—
Waterloo ... ,,		—	—	—	—	—	9.0
Folkestone B. dep.		—	—	—	3.50	—	—
Dover ... T. arr.		—	10.40	11.8	—	10.40	—
,, ... B. dep.		—	11.35		—	11.40	—
Newhaven ... T. arr.		10.10	—		—	—	—
,, ... B. dep.		10.55	—		—	—	—
Southampton B. dep.		—	—		—	—	11.15
		p.m.	p.m.	p.m.	p.m.	a.m.	a.m.
Calais ... B. arr.		—	1.55		6.20	—	—
,, ... T. dep.		—	2.14	2.20	6.50	—	—
Dunkerque B. arr.		—	—	—	—	4.30	—
,, T. dep.		—	—	—	—	5.15	—
Dieppe ... B. arr.		3.25	—	—	—	—	—
,, ... T. dep.		4.17	—	—	—	—	—
Havre ... B. arr.		—	—	—	—	—	7.30
,, ... T. dep.		—	—	—	—	—	8.45
Paris Nord T. arr.		—	5.30	6.5	10.40	9.30	—
,, St. Lazare ,,		7.8	—	—	—	—	11.58

M.O.—Monday nights only

French time is shown in 1949 on the continent; 1 hr. in advance of Greenwich Mean time

B—Boat T—Train

PARIS TO LONDON 1914

9 Services Daily

		a.m.	a.m.	a.m.	noon	p.m.	p.m.	p.m.	p.m.	ngt.
Paris Nord dep.		8.25	9.50	—	12.0	4.0	—	9.20	—	12.30
,, St. Lazare ,,		—	—	10.0	—	—	7.50	—	9.20	—
							ngt.			
Havre ... B. dep.		—	—	—	—	—	12.0	—	—	—
				p.m.					a.m.	
Dieppe ... B. dep.		—	—	1.0	—	—	—	—	1.25	—
Boulogne ... B. dep.		11.45	—	—	—	7.10	—	—	—	—
					p.m.			a.m.		a.m.
Calais ... T. arr.		—	1.5	—	3.26	—	—	1.23	—	6.20
,, ... B. dep.		—	1.25	—	3.45	—	—	1.40	—	6.45
		p.m.	p.m.	p.m.	p.m.	p.m.	a.m.	a.m.	a.m.	a.m.
Southampton T. dep.		—	—	—	—	—	7.20	—	—	—
Newhaven ... T. dep.		—	—	4.45	—	—	—	—	6.0	—
Dover ... T. dep.		—	3.20	—	5.20	—	—	3.45	—	8.20
Folkestone T. dep.		1.40	—	—	—	9.5	—	—	—	—
Waterloo ... T. arr.		—	—	—	—	—	9.0	—	—	—
Victoria ... ,,		—	—	6.10	7.5	—	—	—	7.30	—
Charing Cross ,,		3.25	5.10	—	—	10.45	—	5.43	—	10.15

1949—5 Services Daily and 1 Weekly

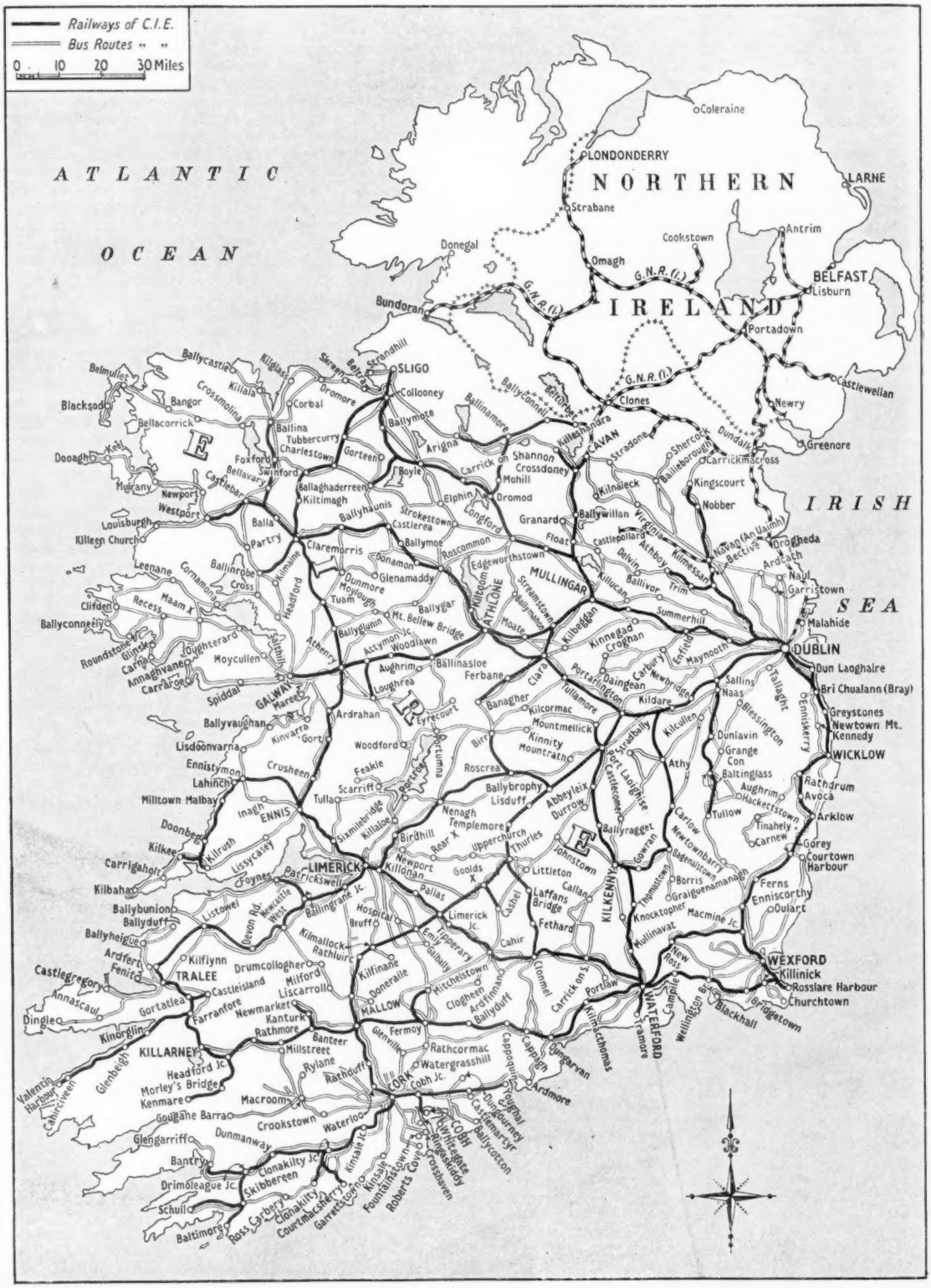
						Tu. O.	
		a.m.	a.m.	a.m.	p.m.	p.m.	p.m.
Paris Nord T. dep.		8.15	—	11.40	12.15	—	9.30
,, St. Lazare ,,		—	9.30	—	—	5.15	—
Havre ... T. arr.		—	—	—	—	8.27	—
,, ... B. dep.		—	—	—	—	11.30	—
Dieppe ... T. arr.		—	12.17	—	—	—	—
,, ... B. dep.		—	1.30	—	—	—	—
							a.m.
Dunkerque T. arr.		—	—	—	—	—	1.34
,, B. dep.		—	—	—	—	—	2.15
Calais ... T. arr.		12.3	—	3.13	3.25	—	—
,, ... B. dep.		12.30	—	4.0	—	—	—
		p.m.	p.m.	p.m.	p.m.	a.m.	a.m.
Southampton B. arr.		—	—	—	—	5.0	—
,, T. dep.		—	—	—	—	6.0	—
Newhaven ... B. arr.		—	4.0	—	—	—	—
,, ... T. dep.		—	4.50	—	—	—	—
Dover ... B. arr.		—	—	4.20	—	—	6.5
,, ... T. dep.		—	—	4.55	5.5	—	7.20
Folkestone T. dep.		1.30	—	—	—	—	—
Waterloo ... T. arr.		—	—	—	—	9.2	—
Victoria ... ,,		3.20	6.35	6.30	6.50	—	9.10

Tu. O.—Tuesday nights only

French time is shown in 1949 on the continent; 1 hr. in advance of Greenwich Mean time

B—Boat T—Train

Rail and Road Routes in Ireland



The principal railway and road routes in Eire operated by Coras Iompair Eireann (Irish Transport Company). The Great Northern Railway (Ireland) is also shown (see page 147)

Eire to Nationalise Transport

LAST weekend the Irish Government announced that it had decided to submit to the Parliament in Dublin, at an early date, proposals for the immediate acquisition of the public transport systems—rail, road, and canal—other than those of the Great Northern Railway (Ireland) Company. The statement, which was issued by the Government Information Bureau, said that the Government had had under consideration the whole transport problem, particularly in the light of the recent report on transport in Ireland submitted by Sir James Milne. Having reviewed the present transport position the Government had decided to submit the following proposals:—

The immediate acquisition of the public transport systems (rail, road, and canal) other than those of the Great Northern Railway (Ireland) Company.

The appointment by the Government of a Transport Board.

Provision of compensation for stockholders and shareholders.

Provision to ensure that dismissal on the grounds of redundancy will not take place, and that such redundancy as may exist will be dealt with on the basis of allowing normal wastage due to retirements, deaths, etc., to be employed in achieving any necessary staff adjustments.

The statement added that, until such time as a decision as to the basis of the compensation to be paid to stockholders and shareholders had been taken and announced, the Stock Exchange authorities had been requested to suspend dealings in the stocks and shares of the transport companies affected by the proposals and in those of the Great Northern Railway (Ireland) Company. It was expected that the announcement as to the proposed terms of compensation would be made in the course of a month.

A summary of Sir James Milne's report was given in our December 31 issue. Since its publication it has been criticised by nearly all the parties to transport in Eire except the Government, which hitherto had given no indication of its policy. Labour interests had urged the nationalisation of Irish transport, and representatives of the stockholders in the Irish Transport Company had suggested that in any reorganisation the common stockholders might be paid off.

The exclusion of the G.N.R. (I.) from the Government's proposals presumably arises because of the difficulty of dealing with the extra-territorial sections of the line. Under Sir James Milne's proposals the G.N.R. (I.) assets in Eire were to be taken over by Coras Iompair Eireann (the Irish Transport Company) and those in Northern Ireland by the Ulster Transport Authority. The G.N.R. (I.) would remain an operating company.

In Sir James Milne's report on Transport in Ireland some prominence was given to the relationship between rail, road, and canal mileage in Ireland to the size of the country and its population, and some comparative figures were given for England and Wales and Scotland. The mileage of roads per 100,000 population is 1,633, compared with 360 in England and Wales and 520 in Scotland. The following table gives details of population and mileage in various relationships:—

	Ireland	England & Wales	Scotland
Area	Sq. miles 26,600	Sq. miles 58,343	Sq. miles 30,410
Population (approximate)	Number 3,000,000	Number 43,000,000	Number 5,000,000
Density of population	Per sq. mile 113	Per sq. mile 737	Per sq. mile 164
Roads	Miles 49,000	Miles 154,700	Miles 26,000
Railways	2,440	16,228	3,625
Canals	415	1,984	152
In relation to area:	Per 100 sq. miles	Per 100 sq. miles	Per 100 sq. miles
Roads	184	265	85
Railways	9	28	12
Canals	1½	3½	½
In relation to population:	Per 100,000	Per 100,000	Per 100,000
Roads	1,633	360	520
Railways	81	38	72
Canals	14	5	3

From the above it will be seen that the highways system of Ireland, consisting of roadways, railway tracks, and canal waterways is very extensive in relation to the size and population of the country. On the opposite page is a map of Ireland showing the principal roads and railway services in Eire, based on an official map issued as an advance programme for C.I.E. tours during this year. The Great Northern Railway (Ireland) is also shown on the map.

* * * *

Snow Clearance on Railways

WHEN Mr. W. K. Wallace addressed the British Glaciological Society in November, on the subject of freeing railway lines from snow, he was asked about the use of rotary snow ploughs and explained that they could not deal effectively with wet snow, but were used in countries with heavy falls of dry snow. Colonel P. M. Brooke-Hitching raised the question again at the end of his letter, which we printed on page 35 of our January 14 issue, suggesting that official dislike of innovations may be the reason for our railways sticking to manpower and the shovel for removing snow.

Actually the districts of British Railways where snowstorms are common are equipped with wedge or wing snow ploughs which can cope with any ordinary fall. The American railways use ploughs of a similar design extensively; any impression that they rely mainly on rotary machines is mistaken. The rotary plough is kept in reserve for dealing with exceptionally deep drifts. Its operating speed is from two to five miles an hour and its use is uneconomical when wing ploughs are able to clear the tracks. When a rotary is at work, it hurls large chunks of snow for considerable distances from the track, so that it can be used with safety only in open country.

The Canadian National Railways know as much about snow-fighting as any railway in the world. Every winter they have to deal with snowfalls varying from an annual average of 54 in. across the prairies to more than 200 in. among the western mountains. Over 6 cents of each dollar spent on maintenance of permanent way represents the cost of snow removal. The Canadian National consequently keeps an ample equipment in readiness for clearing snow and is never loath to try new machines. Mr. J. W. Risk, Superintendent of Work Equipment, Toronto, gave an account of the appliances used in a paper presented to the Roadmasters & Maintenance of Way Association at Chicago last September. The particulars below have been taken from a summary of the paper which was published in the *Railway Age* of November 13.

The Canadian National has 258 wing ploughs and 190 "flangers," which are small ploughs suspended below the guards' vans of freight trains and used when conditions are not acute. Two men operate each flanger from the van, and its purpose is to keep the track clear, as well as reducing the tendency for ice to form between the rails. "Jordan spreaders," to the number of 46, are used to clear yards and stations; with powerful wings, they push the snow from one track to the next, successively throughout the width of the yard, to a point where it can be left in a heap or loaded up for removal. Some 30 bulldozers, three crawler snow loaders, and three "Sicard snow blowers" are turned on to deal with accumulations of snow in stations or yards. It is said that the snow blower can go anywhere, load into anything, or blow snow out into space at the rate of 15 cu. yd. per minute. Lately, a "Barber-Greene snow loader and melter" has been tried successfully for removing snow in terminal yards. Diesel-powered crawler cranes, locomotive cranes, tractors, and road motor vehicles are also diverted from their ordinary work to snow clearing as required.

To complete the list of mechanical equipment, there are 13 rotary ploughs fitted with cutting blades powered by independent steam boilers. These are used in the last resort to deal with deep and compact drifts, which have been known to reach the top of the telegraph poles. Fortunately, emergencies of that kind are rare in this country, even in localities exposed to our wildest weather, whereas in Canada and in the northern regions of the United States they recur too frequently for the peace of mind of railway operators.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Bouquet

Chyngton Down House,
Seaford, Sussex. February 7

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—My hearty congratulations to you on the current issue of *The Railway Gazette* which is packed as full of "meaty" information as it could possibly be. It kept me fascinated for hours, and where all was interesting it would be invidious to mention anything in particular. It is not necessary to wish you success when you give such good value.

Yours faithfully,
GEORGE ELLSON,
Ex-Chief Engineer, Southern Railway

Standardisation of Rolling Stock

The Laycock Engineering Co. Ltd.,
Victoria Works, Millhouses,
Sheffield 8. January 27

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In the final paragraph of the article appearing under the above heading in your January 7 issue it is stated: "The principal disability suffered by the buckeye coupler is the weight involved, and efforts no doubt will be made to effect a reduction in this."

We think that the statement just as it is made may be a little misleading, as, whilst it is a fact that the adding of buckeye couplers to existing stock already equipped with screw link coupling increases the weight, it could be reasonably expected that automatic couplers could be incorporated in a coach designed to accept them without addition to weight.

It is even possible that some appreciable saving of weight may be effected finally, having in mind that for stock run as automatic-coupled stock, screw link couplings and side buffers would be unnecessary and could be eliminated.

Yours faithfully,
L. W. HARDING

The Palestine Railways

Eritrean Railways & Ropeway,
P.O. Box 218,
Asmara,
Eritrea. January 25

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I was greatly interested in your publication *Overseas Railways*, just received, and particularly the description of the Palestine Railways, on which I served during the first world war. It was then known as the Palestine Military Railway.

I see in the article that it is stated that the water pipe line was laid only to Mazar, about half way between Kantara and Rafa. This is not correct, as the pipe line continued to Rafa and later was prolonged on the Beersheba branch beyond the Waddi Guzzi, to either Kahm or Amara.

There was an old prophecy to the effect that when the waters of the Nile flowed into Palestine the power of the Turks in that country would be ended. The waters of the Nile, brought by the pipe line, actually first flowed into Palestine from the drains of the locomotive depot at Rafa, where I was, at the time, District Locomotive Superintendent.

Yours truly,
O. P. C. COLLIER,
General Manager &
Chief Mechanical Engineer

Professional and Technical Staff

Railway Clerks' Association of
Great Britain & Ireland,
25, Euston Road,
London, N.W.1. February 1

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In his letter in your issue dated January 14 "Old Ashfordian" ignores the successful result of R.C.A. work on behalf of professional and technical staff culminating in the award of the Railway Staff National Tribunal which brought substantial improvement to the great majority of that staff. He also ignores the fact that negotiations are proceeding between the Railway Clerks' Association and the Railway Executive for the adjustment of that award in harmony with the Court of Inquiry Award and the "differentials" settlement of last year.

The R.C.A. gives the best possible service to P. & T. Staff, who have a special representative on the Association's Executive Committee and their own special branches, and they also have the fullest opportunity to express their views and desires through advisory committees and consultative conferences. The R.C.A. also provides skilled advocates to act as secretaries to the staff sides of the various P. & T. line committees.

If those who, standing alone, condemn the Railway Executive for inadequate financial recognition given to P. & T. Staff would join the majority of their colleagues in membership of the R.C.A., their added strength would do more to achieve a remedy than their futile unorganised complaining.

Yours faithfully,
P. T. HEADY
Acting General Secretary

Trade Advertising on Railways

February 1

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—On January 17, Sir Cyril Hurcomb told the Institute of Transport that, except in special circumstances, the Commission "heard and would hear, nothing about day-to-day business." He added that "the Commission was not attempting to concern itself with operational management, or technical control." How can these statements be reconciled with the announcement that the Commission is going to take over the control of commercial advertising from the Executives?

This move means the centralisation in the Commission's hands of detail work of a comparatively low grade. The amount of revenue earned from commercial advertising depends largely on canvassing for orders. The work has no connection with "Public Relations and Publicity" in the proper sense of these terms, and involves many communications between the advertising staff and the Regional departmental officers. It seems all wrong that an Agent responsible to the Commission should conduct correspondence with, and give orders to, these Regional representatives of the Executives. On the other hand, the agent couldn't pass all communications through the Executives' headquarters without causing endless work over trifles. It rather looks as though the proposal has not been thought out thoroughly.

Yours faithfully,
NOVOCASTRIAN

Passenger Fares and Train Services

February 1

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Thank you for the complimentary remarks in your January 28 issue regarding my article "The Problem of Railway Passenger Fares and Train Services." Your editorial, in my view, gives a very fair criticism of the article, my only comments being:—

(*a*) I agree the scheme could not be applied to *existing* train services generally, but I see no reason why eventually it should not be so applied, including the York-Newcastle section of line. Assuming the same total number of trains between these points to remain at ten, a certain number, say five, of these could be decelerated to take 2 hr. 20 min. by inserting additional stops, thus becoming "ordinary" trains, and the remaining five could be accelerated to a journey time of 90 min. by cutting out some of the existing stops. The character of the trains each side of York and Newcastle, respectively, would decide which should be "ordinary" and which "express."

(*b*) Concerning the proposed increase in express return fares as compared with existing monthly return fares, the provision of "ordinary" services with fares at *less* than the existing monthly return and at speeds in excess of the motor coaches, and with greater comfort should avoid any diversion to the motor coaches for third class passengers. I do not think the question of cost has much influence on whether people travel by air or rail. Those who like air travel can generally find the few extra shillings, but a very large number of people do not like it, or don't think it worth the risk.

Yours faithfully,
YOUR CORRESPONDENT

"A Railway Engineering Career"

Eastleigh, Hants. February 1

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Since my last letter to you, published in your issue of January 14, I have made more enquiries regarding rates of pay of railway engineers and have unearthed some facts which should evoke surprise, if not interest.

I said that a young man, by improving himself and qualifying for entry into the drawing office, loses about 30s. a week. I now find that I underestimated his loss. It is over £2.

The actual figures for a young man, on coming out of his apprenticeship, show that as a tradesman he would receive 46s. *plus* 50 per cent. piecework bonus *plus* 60s. cost of living

bonus, a total of 129s. a week, which equals £335 per annum, whereas as a junior draughtsman he receives £230 according to the scale laid down by the arbitration award. He usually has the O.N.C. and may have the H.N.C., but if he had a job as a labourer he would receive £271 a year.

Although the tradesman's wage rate is constant, while that of the draughtsman increases annually, the latter will lose £330 by the time he is 26. Thereafter he makes up lost ground so slowly that he is 33 before he wipes off this deficit.

The latest R.C.A. charter completely ignores professional and technical staff and proposes scales of pay for clerical staff better than those now received by the former.

Keen interest in the job seems to blind youthful engineers to the low value placed on their services, and it is usually realised too late for them to make any drastic change.

If Sir Eustace Missenden really wants to make railway engineering service attractive to young men, let him make some amends to the older ones, who then will be able to advise prospective recruits that their future will not be marred by the thought that they have chosen a job which, although full of interest, carries little in the way of financial reward.

Yours faithfully,
OLD ASHFORDIAN

Motive Power Classification

36, Highbury Grove,
London, N.5. February 4

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Referring to the letter from Mr. H. N. A. Shelton, in your issue of January 28, I agree with his suggestion that an engine classification system on simple lines is essential.

The drawback of a running number scheme is that No. 7017 can come into the "4073 class," which is misleading.

Names, also, can be exhausted. How many more "Hall" names remain unused?

The L.N.E.R. scheme, with a letter for each wheel arrangement, is simplicity itself. So is the L.M.S.R. scheme of power classification, *e.g.*, 7P, 8F, etc.

Again, the L.N.E.R. route availability designation, RA6, etc., is better to use in conjunction with the other number and letter descriptions than a colour identification.

The drawback is that too clever people may try to unite them, say, "A13-8P-RA9." This, like 2C1-207, does not make identification of a class quick enough. Therefore, let the L.N.E.R. scheme be used for identity, the L.M.S.R. for power classification, and the L.N.E.R. for route availability. But never together. One could go on the buffer beam, now so bare, the others in left and right corners of the cab side sheets. All, too, could appear in diagrams—but in different places.

Yours faithfully,
F. A. S. BROWN

Fantastic Project in Africa

22, Queen Anne's Gate,
London, S.W.1. January 18

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Among various proposals which have been ventilated recently for new railways in tropical Africa perhaps the most fantastic is the suggested route from the Northern Rhodesian copper belt to the new port of Mikindani, crossing Lake Nyasa by means of a train ferry. The rough profile reproduced of the route, showing for comparison, the approximate profile of the route to Beira (assuming that the Kariba Gorge cut-off, shown dotted, were in existence) indicates clearly what the relative operating costs and traffic-carrying potentialities of the two routes would be. It must be borne in mind also that the level of Lake Nyasa varies over a long period by as much as 20 ft., so that train ferry terminals necessarily would be difficult to construct and expensive. The lake is also subject to violent storms—the Nyasaland Railway's largest vessel, the *Vipya*, was lost some years ago with a heavy death roll during a lake squall—and the distance between the two terminals would be about 40 miles

Yours faithfully,
G. H. LEPPER

Sunday Trains from Bradford

415, Wells Road,
Bristol. February 1

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In your issue of January 14, Mr. J. W. Rattray writes respecting a protracted journey to London, St. Pancras, when he left Bradford on the 11 a.m. Sunday train.

I would point out that the gentleman should have changed at Leeds (instead of Derby) where across the platform at which the train from Bradford arrived, a train was due to leave at 11.55 a.m. to London, *via* Leicester, without change, and was scheduled to arrive at St. Pancras at 5.35 p.m. The 11 a.m. train from Bradford, Forster Square, is a through train to Bristol.

Yours truly,
F. S. CARLISLE

The Communication Cord

52, Chalk Hill, Bushey,
Watford, Herts. January 31

TO THE EDITOR OF THE RAILWAY GAZETTE

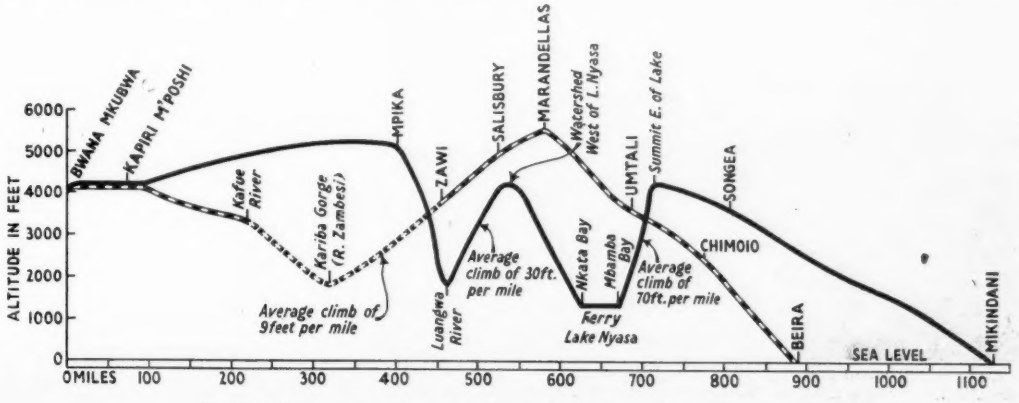
SIR,—In reply to Mr. J. E. L. Skelton's letter in your issue of January 28, I would state that there are no different instructions issued to drivers when the cord is pulled either on corridor or compartment stock.

A driver, observing an unusual diminution of vacuum, must infer that the cord has been pulled. He must stop his train with as little delay as possible, but he must use his discretion in stopping. It would be most undesirable to stop on a viaduct, bridge, or in a tunnel, because if it were during the hours of darkness, whereby passengers had to jump from the carriages because of fire, etc., the consequences would be serious if the driver had stopped his train at such a place.

It is advisable to stop the train under the protection of fixed signals if possible, and that varies according to circumstances. As an example, if the fixed signals are situated on a viaduct, as in some cases, it would be advisable to bring the train to a stand before reaching the viaduct. There are other cases of how the driver, fireman, and guard should act when the cord is pulled, during block failures, etc., but that would take up too much space to explain.

The responsibilities attached to the driver, fireman, and guard vary according to the circumstances. For instance, if passengers are leaving the carriages after the train has stopped, trains must be stopped on all lines as well as in the rear—that is their first duty. Secondly, they must deal with or prevent fire, and their third duty is to attend to the requirements of the passengers.

Yours faithfully,
S. F. SMITH
Rules Inspector,
London Midland Region



Profile of two routes from Northern Rhodesia to the Indian Ocean

The Scrap Heap

"Ask Your Mother"

Mr. O. V. Bulleid writes:—

We frequently see in the Press the advice to "ask your Dad," but sometimes it may be suggested it is better to "ask your Mother." As an example I append a quotation from a letter from my wife to Mrs. Ivatt, dated October 6, 1914:—

"I got to Kings Cross soon after 5.30 and got into the Doncaster coach. O. had had no lunch to speak of, so was extravagant, and we both dined on the train, and a *very* excellent dinner it was too—soup, filleted sole, roast beef with roast or boiled potatoes and spinach, roast duck with apple sauce and sage and onions, apple tart and cream, cheese and biscuits, rolls, butter and then dessert, and all *very* well cooked. The journey passed in no time."

You will no doubt remember that the price was then 3s. 6d.!

* * *

100 YEARS AGO

From The Railway Times, *Feb.* 10, 1849

But will people in this wealthy country give up speed? Will there not always be a certain number who will pay any money for the luxury, which is in fact a lengthening of life by economy of time? And this brings us to Mr. Smiles's question of "Railway Economy."

We think he is wrong in his views of diminishing the number of trains. He should rather aim at diminishing the cost of them. No truth is more certain than that frequent departures induce numerous passengers in the most paying portion of lines—the short traffic. And this brings us to Mr. Smiles's remarks on the steam-carriage system of Messrs. Adams and Samuel. We think with him, that this plan is founded on true economy—the diminution of dead weight or non-paying loads: twenty and twenty-four tons of dead load to one of paying load is the proportion of most branch lines. Without indulging in dreams of the universality of this plan, we yet see abundant advantages in it for the public and the railway proprietary. First, as to stopping trains calling at many stations: it is now beyond a doubt, that a steam-carriage weighing thirteen tons and carrying fifty passengers, can take a tender-carriage and fifty other passengers at a running speed of 30 miles per hour, and stop every six miles, with an expenditure of twelve pounds of coke per mile, say 25 miles per hour, including those stoppages.

Red and Green

It seems that red is to be the predominant colour of many new railway vehicles, with green chosen for the remainder.

Can we assume that one colour has been selected as a compliment to the political views of the exponents of nationalisation, and the other as a tribute to the length of their experience in industrial administration?—*Mr. Guy Harrison in a letter to "The Daily Telegraph."*

* * *

The Hennecke Movement

In Russia one of the chief factors in increasing productivity has been the Stakhanovite movement, which encourages individual workers not merely to work harder but to think out means of rationalising their jobs. This seems to have been quite effective in Russia, though a farrago of propaganda has been found necessary in order to sell the idea.

But Russian methods are not always suitable for export, and foreign Communists who copy the eccentricities of the Soviet Fatherland make mistakes.

Thus, in the Russian zone of Germany the German Economic Commission has now produced its poor man's Stakhanov: Adolf Hennecke, also a miner, who on October 13 fulfilled an unspecified target by 380 per cent. There is now a Hennecke movement; there are Hennecke months and Hennecke weeks—in Halle every Wednesday is to be a Hennecke day; and Hennecke himself has been congratulated by Stakhanov as well as by the leading German Communists. This sort of nonsense seems nicely calculated to appeal to the German sense of humour, and the result has been a spate of Hennecke stories. Thus:

> The porter at the Unity party's headquarters in Berlin has been made a Hennecke "activist." He used to open and shut the door. Now he leaves it open all day, and fulfils his target by 4,000 per cent.

or,

> Hennecke has been thrown out of the Church. While he and his family were standing around the Christmas tree he was singing the hymns for Easter.

Others are less printable. And the result? A new "Order for the Protection of the Working Morale of the German Population": Hennecke stories are to be punishable with three months' gaol. The party bureaucrats must be upset; it could never have happened in Russia.—*From "The Manchester Guardian."*

A Busy Year for the Dover-Dunkerque Ferry

More than 100,000 of the 1,300,000 passengers who travelled by Southern Region Continental Services in 1948 used the Dover-Dunkerque train ferry service, which also carried more than 10,000 cars during the year.

Cargo by the train ferry services during 1948 totalled 150,000 tons, and included imports of fruit, vegetables, nuts, cheese, wine, spirits, poultry, and large quantities of dates. Export traffic consisted of Australian wool to manufacturing areas in Northern France, machinery, steel and metal products, and in the last quarter of 1948 more than 1,500 cars and motor cycles.

Unusual cargoes included Olympic Games equipment, Continental theatrical companies' scenery and effects, and valuable cargoes of art treasures. Six double-deck buses, exhibits at the Brussels and Copenhagen Fairs, were also conveyed, as well as more than 100 motorcoaches engaged on London-Continental coach tours.

* * *

The Government Working Party reporting on reception arrangements for tourists at the ports visited Southampton recently.

At a social function at which the party were entertained, one of the members of the Working Party mentioned that on arrival at Southampton Central—having left Waterloo by the 10.30 a.m. train—as they left the station to proceed to their hotel, the chimes from the civic centre clock pealed the well-known hymn, "O God Our Help," which he thought the Dock Authorities might consider somewhat appropriate!

The reply from the dock official—who shall be nameless—was to the effect that if the member of the Working Party concerned would lean out of the window when the train left Southampton Central for Waterloo at the end of their visit, he would hear the same chimes playing, "Now Thank We All Our God"!

* * *

Theatre Special

A local railway is going to experiment with a Broadway special. Suburbanites living up to 70 miles from New York will be able to buy tickets for the shows from railway booking offices. The train will bring them into town in time for dinner and the show, and on the return trip supper and drinks will be served to complete the night out.—*From the "Daily Express."*

* * *

Tailpiece

Seeing Red

The mighty secret's out at last,
The verdict's given, the die is cast;
We know the hierarchy's views
On railway transport's various hues.

Now the selectors' task is done
The paint shops will have lots of fun
Endeavouring to decide between
The red and cream, the blue and green.

Painters express themselves, we know.
In patient, rhythmic "to and fro,"
They seldom let their passions play
With pot and brush and whirling spray.

But, one day, one may rise amid
The symbols of his craft and bid
Some over-bearing foreman take
A jump into the crimson lake!

A. B.

Broad Green Station in 1865

Reproduction of a postcard photograph of Broad Green Station on the Liverpool—Manchester line in 1865 *which is in the possession of Mr. Alfred Yates, a retired railwayman. Mr. Yates' family have lived in the house adjoining the station for over* 80 *years*

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

SOUTH AFRICA

Financial Results

At the end of the first seven months of the present financial year the South African Railways had a total accumulated deficit of £2,005,211. The special disability allowance in the Johannesburg and Pretoria areas is now being paid and, with cost of living allowances, is making heavy demands on railway revenue.

In October the operation of the railway, harbour, steamship, airways and aerodromes services resulted in a deficit of £644,115, as compared with a deficit of £427,531 in September. Revenue for the month at £7,335,998 was higher than in September, but expenditure, excluding net revenue appropriations, amounted to £7,937,647, largely because of cost of living payments and temporary special disability allowances.

Taking the railways alone, a deficit on their working for October amounting to £704,264 was recorded, and airways showed a deficit of £174,862. Harbours reflected a surplus of £277,521 and net revenue appropriations amounted to £42,466, leaving the overall deficit mentioned above.

RHODESIA

Working Results

The total receipts for all sections of the Rhodesia Railways system (including the Beira and Shabani Railways) for October, 1948, were £852,225. Expenses amounted to £679,325, leaving a net operating revenue of £172,900. For the seven months ended October 31, 1948, the receipts were £5,888,111, less expenses £4,360,973. The receipts were £994,939 higher than for the corresponding period in 1947, but expenses were also greater by £576,267, giving a net operating revenue of £1,527,138 This was £418,672 more than for the comparative months of the preceding year. Two new records were established last October—420,130 tons conveyed over the lines north of Bulawayo, and 1,356·01 net ton miles run per wagon day.

Rolling Stock Orders

Locomotives and rolling stock on order include 50 Beyer-Garratts, 97 passenger coaches and 10 passenger vans, 25 petrol tank cars, 1,765 goods wagons, and 80 goods guards vans.

PAKISTAN

Suburban Lines Proposed

Two cities in Pakistan, Karachi and Lahore, are likely to have suburban railways. Karachi already has formulated plans and is to have a 20-mile long circular railway. The route of the proposed railway will be from Hardinge Bridge (near Karachi Port Trust Headquarters) to Malir Cantt. *via* Trading Estate and Mangho Pir; and from Malir Cantt. *via* Drigh Road, Karachi Cantt. and city station back to Hardinge Bridge. It is expected that a new track will be laid from Malir Cantt. to Hardinge Bridge *via* Drigh Road and Karachi Cantt.

Inter-Dominion Movements

The inter-Dominion conference between representatives of India and Pakistan, recently held at Karachi, has agreed that there will be uninterrupted flow of petrol and other oil traffic from Karachi to stations on the Eastern Punjab Railway. To ensure this, it has been agreed that the N.W.R. shall continue to provide tank wagons for loading this traffic as hitherto, that the E.P.R. should see that all N.W.R. oil tank wagons are returned immediately after being emptied, and that the two railways in consultation should work out the total number of wagons required for this service on the basis of the normal turnround, and determine the number of tank wagons which ordinarily would remain in the Eastern Punjab area at any time, so that it should be possible to check whether a hold-up has occurred.

INDIA

Rupar-Talura Railway

The opening of the newly-constructed 35-mile broad-gauge line between Rupar and Talura of the Eastern Punjab Railway has connnected by rail the land-locked area between the river Sutlej and the lower Himalayas. It has facilitated the transport of labour, material, and machinery to the sites of the Bhakra and Nangal multi-purpose projects for irrigation and generation of electricity, which when completed are expected to change the face of the Eastern Punjab and neighbouring States. The last station on the new line, Nangal Guzar, is less than half a mile from the Nangal power project and about 10 miles from that of Bhakra Dam. The Eastern Punjab Government has shared the cost of construction of the line with the Central Government.

CANADA

Sleeping Car Fares Increased

Because of increased costs of operation, fares for sleeping and parlour car travel within Canada were raised on January 15. The amount of the increase has not been given, but it is learned that such fares on both the Canadian National and the Canadian Pacific Railways were to be raised by from 20 to 25 per cent., varying according to locality.

Increase in Fish Rates

The Canadian railways have served notice they are increasing express rates on fish on February 14 by amounts ranging up to 40 per cent. Higher tolls filed with the Board of Transport Commissioners will affect several million pounds annually of fresh and frozen fish moving mostly from points on the East and West coasts. It is estimated that the move will increase shipping costs for maritime shippers of fish by more than $100,000 a year.

Conversion of Locomotives to Oil Burning

The Canadian Pacific Railway is to convert 100 steam locomotives used in southern British Columbia and between Calgary and Edmonton from coal to oil burning. Fuel oil originating from the newly-developed Alberta fields will be used and installation of wayside facilities for oil operation will begin immediately on the 862 miles of line in the Kootenay and Kettle Valley Divisions in southern British Columbia and along the Calgary-Edmonton route.

The conversion will greatly assist the growing oil industry by providing a stable market for the residual fuel oil from prairie refineries, thereby permitting further expansion in the production of gasoline and light distillates for prairie distribution.

Alberta oil already is used on the main line from Calgary to Kamloops—extension to Kamloops from Revelstoke having been made in the past year—and consideration is now being given to its use right through to Vancouver. A further part of the trend to oil-burning power on the west coast is the dieselisation now in progress on the Esquimalt & Nanaimo Railway on Vancouver Island.

UNITED STATES

New Electrics for the Reading Company

Eight new motor-trailer car units designed for multiple-unit operation from 11,000-volt overhead are to be placed in service on the electrified Philadelphia suburban service of the Reading company. The motor cars are being built by the American Car & Foundry Company, which is also turning out the trailers from former steam stock supplied by the railway. From an operating standpoint the new units will be duplicates of the existing suburban equipment, to permit the operation of new and old coaches in the same train. Combined steel and aluminium construction is used for the motor cars.

Chicago Terminal Problem

Recently, the Chicago municipal authorities indicated that they will reject the plan devised by the Chicago South Side Terminal Committee, which was set up by the railways terminating on the south of Chicago, for modernising four passenger stations south of the "Loop" (the business area) and relocating freight depots. Submission of the plan to the Mayor of Chicago was reported in our October 1, 1948, issue. The city authorities want the railways to combine the facilities in only one or two termini, but the committee, whose report was the result of a 2½-year study, emphasises that consolidation of the stations would be prohibitively costly.

GREECE

Guerrilla War and Railway Wrecking

The destruction of all means of communication has been one of the main objectives of the insurgents in their renewed large-scale activities against the Government. A report recently issued by the Ministry of Transport contains particulars of the widespread damage caused by the rebels. In a period of 90 days eight trains on the State Railway system were blown up and the system wrecked at 60 points on sections of lines which had been reconstructed in recent years, thanks to American assistance; forty-three railway bridges were blown up, and seven station buildings destroyed. On the narrow-gauge Thessalian system four bridges and three station buildings were destroyed, and four trains were attacked, eleven bridges blown up and six station buildings destroyed on the metre-gauge Peloponnesian system. Telephone lines were cut or made otherwise unserviceable at some 3,000 points. Wrecked telephone lines total now some 35 route-miles, and in many cases the wires have been taken away. Six postal buildings and three telegraph offices were blown up.

The Premier has stated that British and American expenditure for aid to Greece totalled $836 million up to the autumn of 1948, a considerable part of which accounted for the reconstruction of railways, roads and other means of communication, including the Corinth Canal.

Major Developments in Locomotive Design

IN delivering his Presidential Address to the Institution of Locomotive Engineers, Lt.-Colonel Harold Rudgard, O.B.E., included a valuable historical survey of developments in locomotive design. Lt.-Colonel Rudgard's paper was reported in our September 24 issue, and his comments were supported by a most useful tabular list, giving the dates of the principal innovations in design, which we reproduce in full, in view of its value for quick and easy reference.

It must have been a difficult matter to decide what items to include and what to omit in such a list. To give an absolutely complete set of items would be almost impossible; but the moment anything is left out, someone or other will probably draw attention to the omission. Alternatively, a claim may be made that some item listed here was introduced elsewhere at an earlier date. We imagine that the adjoining list is representative of what, in Colonel Rudgard's opinion, constitute the chief landmarks. Thus, the inclusion of H. A. Ivatt's "single-driver" of 1901, a design in which no new departures were made, is of interest as it marked the end of an epoch; for this was the last "single-driver" type for British railways.

Claims for inclusion in the table might be made for many other items, of course. The three-cylinder high-pressure locomotive (apart from the famous Decapod experiment) really began in 1907-8 with the Robinson 0-8-4 tank engines for Wath concentration sidings, and was shortly afterwards adopted by Wilson Worsdell for a 4-8-0 design of tank engine for similar duties on the North Eastern, after which it graduated, so to speak, to main-line duties. Another forgotten landmark, remembered by Sir William Stanier in his Presidential Address to the Institution of Mechanical Engineers,* was the long-travel long-lap valve introduced by George Hughes on the Lancashire & Yorkshire Railway in 1908, though (as Sir William pointed out) the significance of this vital step forward was not appreciated by that company at the time. In many respects, as later events have shown, this was one of the foundation stones on which modern practice rests. In more recent years, the use of welding in boilers of the "Merchant Navy" locomotives designed by Mr. Bulleid is to be regarded as an event of the first importance. It is to be noted that no mention of streamlining is made in Colonel Rudgard's list, and it will be interesting to see how widely it is being used, say, ten years from now.

In general, the table sticks to British practice, and very few items originating abroad have been included, and then only because they have had a marked effect in this country. Thus, the Walschaerts valve gear, the Belpaire firebox, the smoke-tube superheater, and the de Glehn compound are noticed, but Brotan fireboxes and the Zara pony truck are omitted. The A.C.F.I. feed-water heating system had an extended trial in this country; but locomotive engineers in this country generally avoid feed-water heating if they possibly can, so there is no permanent trend to record. With the price of coal at its present level, however, accompanied by every indication that it will be increased further instead of being reduced in the future, it may be necessary to give more attention than in the past to the improve-

* Proc. I.Mech.E., 1941, vol. 146, page 51

1801	Direct acting engine with slide bars	W. Symington (1763-1831)
1802	Two-cylinder engine with cranks at right angles	M. Murray (1763-1826)
1804	Steam engine on rails	R. Trevithick (1771-1833)
1806	Short "D" slide valve	M. Murray
1812	Rack and pinion locomotive	Blenkinsop and Murray
1812	Spring loaded safety valve	Fenton
1813	Steam horse; Butterly, Derby	Brunton
1813	*Puffing Billy* geared locomotive	W. Hedley (1779-1843)
1814	Geared wheel locomotive	G. Stephenson (1781-1848)
1815	Direct coupled locomotive	G. Stephenson
1816	Loose eccentric valve gear	G. Stephenson
1818	Single fixed eccentric valve gear	Carmichael's
1825	*Locomotion No. 1*, Stockton & Darlington Railway	G. Stephenson
1826	Multi-jet blast pipe; fusible plug; expansion valve gear	G. Gurney (1793-1875)
1827	*Royal George* (Spring equalising levers), 0-6-0 type (Originally four-cylinder locomotive)	T. Hackworth (1786-1849)
1827	Gas vacuum engine experiments (London)	Brown and Gordon
1828	*Lancashire Witch* (Expansion valve gear)	R. Stephenson (1803-59)
1829	*Rocket* (Multi-tubular boiler)	R. Stephenson
1829	*Novelty* (Inside crank shaft)	Braithwaite and Ericsson
1830	Dome-shaped firebox; bar frames	E. Bury (1794-1858)
1832	Steam brake; piston valves; petticoat blast pipe	R. Stephenson's
1833	0-6-0 inside-cylinder locomotive	R. Stephenson
1833	Bogie fitted to locomotive, Dundee & Newtyle Railway	Carmichael's
1836	Four fixed eccentrics; gab motion	Forrester's
1837	*North Star* (R. Stephenson's), G.W.R.	Sir D. Gooch (1816-89)
1839	Expansion valve motion, North Midland Railway	J. Gray
1839	Wedge valve motion, North Midland Railway	Dodds and Owen
1839	Variable blast pipe	Rothwell
1839	Steam superheating (Hackworth)	Hawthorn's
1840	4-2-0 *Philadelphia*, B. & G.R.	Norris (U.S.A.)
1841	Long boiler locomotive, N.E.R.	R. Stephenson's
1841	Sanding gear, grid-iron regulator	R. Stephenson's
1842	Howe-Stephenson link motion, North Midland Railway	R. Stephenson's
1842	Electric propulsion experiments, Edinburgh & Glasgow Railway	R. Davidson
1843	Stationary link motion, G.W.R., L.S.W.R.	D. and J. V. Gooch
1844	Walschaerts' radial valve motion (Belgium)	E. Walschaerts (1820-1901)
1844	Pneumatic brake	Nasmyth and May
1846	The atmospheric system: Croydon, S. Devon, Dublin	Clegg and Samuda
1846	Three-cylinder locomotive, L.N.W.R., Newcastle & Berwick Railway	R. Stephenson's
1846	Crampton's design; long low boilers	T. Crampton (1816-88)
1846	4-2-2 locomotive, G.W.R.	Sir D. Gooch (1816-89)
1847	4-2-2 locomotive *Cornwall*, L.N.W.R.	R. Trevithick
1847	Balanced slide valve; axlebox oil pads, L.N.W.R.	A. Allan (1809-91)
1848	Steam rail coach, Eastern Counties Railway	W. B. Adams (1797-1872)
1849	4-4-0 T locomotive (sledge brake), G.W.R.	Sir D. Gooch
1850	Double beat regulator valve, L.N.W.R.	J. Ramsbottom (1814-97)
1852	Solid piston with narrow split rings, L.N.W.R.	J. Ramsbottom
1852	Superheating experiments, L.N.W.R.	J. E. McConnell (1815-83)
1852	Drop grate fitted	Bury's
1853	4-2-4 T locomotive, Bristol & Exeter Railway	J. Pearson
1854	Feed water heating experiments, L.S.W.R.	J. Beattie (1804-71)
1854	Straight link motion; engine plate frames, Scottish Central Railway	A. Allan
1856	Duplex safety valves; screw reverser; displacement lubricator, L.N.W.R.	J. Ramsbottom
1858	Firehole deflector plate, B.L. & C. Jct. Rly.	Douglas
1859	Brick arch and firehole deflector plate, Midland Railway	M. Kirtley (1813-74)
1859	Locomotive steel tyres, L.N.W.R.	Naylor and Vickers
1859	Giffard's injector (Sharp, Stewart & Co.)	M. Giffard (1825-82)
1860	Steel firebox tests, Scottish Central Railway	A. Allan
1860	Water pick-up apparatus, L.N.W.R.	J. Ramsbottom
1862	Steam tender, G.N.R.	A. Sturrock (1816-1909)
1864	2-4-2 T locomotive, G.E.R.	R. Sinclair (1816-97)
1864	Radial axlebox, North London Railway	W. B. Adams
1867	Long travel slide valve, L.S.W.R.	J. Beattie
1868	Counter pressure brake, L.N.W.R.	Le Chatelier
1869	0-4-4 T locomotive, Midland Railway	M. Kirtley
1870	Eight foot single driving locomotives, G.N.R.	P. Stirling (1820-95)
1871	Compressed air brake, Caledonian Railway	Steel and McInnes
1872	Flat top firebox (Belpaire)	A. Belpaire (1820-93)
1874	Non-automatic vacuum brake, N.E.R.	Smith
1874	Pop safety valves	T. Adams
1874	Speed indicators, L.B.S.C.R.	W. Stroudley (1833-89)
1876	0-6-4 T locomotive, G.S. & W.R.	A. McDonnell (1829-1904)
1876	Hydraulic brake, L.N.W.R.	F. W. Webb
1876	Exhaust injector	Davies and Metcalfe
1878	Automatic vacuum brake	Gresham
1878	2-6-0 locomotive, G.E.R.	W. Adams (1823-1904)
1879	Compound locomotives, L.N.W.R.	F. W. Webb (1835-1906)
1879	Joy's radial valve gear, Furness Railway	D. Joy (1825-1903)
1882	Conjugated valve gear	D. Joy
1882	Vortex blast pipe, L.S.W.R.	W. Adams
1882	0-4-2 "Gladstone" type, L.B.S.C.R.	W. Stroudley
1886	Steel Frame Plates, L.N.W.R.	F. W. Webb
1886	Steam sanding, Midland Railway	Holt and Gresham
1887	Extended smokebox, G. & S.W.R.	J. Smellie
1888	Compound locomotives, N.E.R.	T. W. Worsdell (1838-1916)
1889	Eight-wheeled tenders, G.N.S.R.	J. Manson (1846-1935)
1889	0-8-0 locomotive, Barry Railway	Sharp, Stewart
1893	Oil fuel locomotives, G.E.R.	J. Holden (1837-1925)
1894	4-6-0 locomotive, Highland Railway	D. Jones (1834-1906)
1897	Four-cylinder (H.P.) locomotive, G. & S.W.R.	J. Manson
1897	Smoketube superheating, Germany	W. Schmidt (1858-1924)
1897	Double chimney, L.N.W.R.	F. W. Webb
1897	Large diameter boilers, Caledonian Railway	J. F. McIntosh (1846-1916)
1898	Three-cylinder compound, N.E.R.; Midland Railway	W. M. Smith
1899	Smokebox superheater, L.Y.R.	Sir J. Aspinall (1851-1937)
1901	Single driving locomotive, G.N.R.	H. A. Ivatt (1851-1923)
1902	4-4-2 wide firebox locomotive, G.N.R.	H. A. Ivatt
1902	0-10-0 T locomotive, G.E.R.	J. Holden
1903	Steel corrugated firebox, L.Y.R.	H. A. Hoy (1854-1911)
1903	2-8-0 locomotive taper boiler, G.W.R.	G. J. Churchward (1857-1933)
1903	4-4-2 De Glehn compound, G.W.R.	G. J. Churchward
1904	Feed water heating, L.S.W.R.	D. Drummond (1840-1912)
1907	Deeley's valve gear, Midland Railway	R. M. Deeley (1855-1944)
1908	4-6-2 locomotive, G.W.R.	G. J. Churchward
1908	2-6-2 locomotive with eight single acting cylinders and rotary valves, Midland Railway	Sir C. Paget (1874-1936)
1911	Turbine-electric locomotive trials, Caledonian Railway	North British Locomotive Co. Ltd.
1912	Mechanical lubricator "Crewe," L.N.W.R.	C. J. Bowen-Cooke (1859-1920)
1912	4-6-4 "Baltic" tank locomotive, Midland Railway (L.T.S.R.)	R. H. Whitelegg
1913	Stumpf Uniflow locomotive, N.E.R.	Sir V. Raven (1859-1934)
1919	0-10-0 cross ported four-cylinder locomotive, Midland Railway	Sir H. Fowler (1870-1938)
1919	Turbine-electric locomotive	Armstrong-Whitworth's

ment of the thermal efficiency of the boiler. This may mean that makers of feed-water heaters and pumps will find it advantageous to consider how their designs may be improved, with the twin objects of raising the percentage of availability and diminishing repairs and maintenance.

Colonel Rudgard does not hesitate to include British ideas which have not "caught on," such as the Sturrock steam tender and the Kitson-Still locomotive. The inclusion of these experimental ideas, often full of promise, in theory, adds greatly to the interest.

1922	4-6-2 three-cylinder (H.P.) locomotive, G.N.R.	Sir N. Gresley (1876-1941)
1923	Reid-McLeod turbine locomotive	North British Locomotive Co. Ltd.
1924	2-8-2 three-cylinder (H.P.) locomotive, L.N.E.R.	Sir N. Gresley
1926	Ljungström turbine locomotive trials, L.M.S.R.	Sir H. Fowler
1926	Lentz poppet valve gear, L.N.E.R.	Sir N. Gresley
1927	Beyer-Garrett locomotive, L.M.S.R.	Sir H. Fowler
1928	Caprotti poppet valve gear, L.M.S.R.	Sir H. Fowler
1929	Internal combustion and steam locomotive, L.N.E.R.	Kitson-Still
1929	4-6-4 high pressure compound locomotive, L.N.E.R.	Sir N. Gresley
1929	4-6-0 high pressure locomotive (*Fury*), L.M.S.R.	Sir H. Fowler
1932	Smoke deflector plates, Southern Railway	R. E. L. Maunsell (1869-1944)
1934	Non-condensing turbine locomotive, L.M.S.R.	Sir W. Stanier
1934	Diesel-electric shunting locomotive, L.M.S.R.	Sir W. Stanier
1941	Chain-driven valve gear (enclosed), Southern Railway	O. V. Bulleid
1942	0-6-0 austerity locomotive	O. V. Bulleid
1943	2-8-0 austerity locomotive	R. A. Riddles
1947	0-6-6-0 diesel-electric main-line locomotive, L.M.S.R.	H. G. Ivatt
1947	Gas-turbine electric locomotive, G.W.R.	F. W. Hawksworth

Heavy Bridge Reconstruction in U.S.A.

Featuring an unusual design of concrete-filled tubular-pile pier, maximum use of old materials, and minimum interference with traffic flow

THE West Pascagoula River is crossed within half a mile of the Gulf of Mexico by the single-line Mobile to New Orleans section of the Louisville & Nashville Railroad, the bridge spanning it being nearly 2,400 ft. in length. This bridge as it existed until 1947 is shown in one of the accompanying illustrations. The 14 main spans consisted of through-type plate girders at 16-ft. centres, and 97 ft. in length. They were supported by timber-pile piers, but the piles were constantly being attacked by the teredo mollusc. The piers, moreover, were loaded to the safety limit, and the replacement of the piles was increasingly difficult, expensive, and unsatisfactory; further replacement eventually was considered impracticable. As a result, the rebuilding of the bridge had to be faced, with due regard to the following conditions.

The replacement of the trestle approach viaducts was unnecessary, and it was undesirable to interfere with the existing approach embankments crossing marshland, but consolidated in the course of years. From the operating point of view, it was desirable to retain the existing alignment and cause no interruption to traffic. Most important, however, was the fact that the existing main spans were in good condition and capable of carrying all loads likely to be demanded for some time to come. Any new structure would have to be designed to withstand the severe hurricanes to which this area is subject, and for this same reason it also was undesirable that a temporary trestle viaduct carrying a track diversion should be built to carry the traffic while the permanent bridge was being rebuilt.

After considering several different schemes for reconstruction, the engineers finally decided to retain the existing spans and alignment, but to construct new piers midway between the old ones, and to move the spans longitudinally on to them. To keep the bridge open to traffic without interruption, and to provide a teredo- and hurricane-proof structure, the new piers were designed with heavy reinforced concrete capping girders, supported at each end by eight 24-in. steel tubular piles filled with reinforced concrete and spaced sufficiently far from the centre line of the track and spans to enable pile driving to proceed without hindrance to traffic.

The drawings of a pier-top, reproduced, show that the inner rows of piles are 24 ft. apart, centre to centre, and that the capping girder measures 34 ft. 6 in. × 13 ft. 6 in. × 5 ft. 4 in. and 5 ft. 9 in. deep at the centre and ends respectively. Each pile consists of 24-in. spirally-welded Armco steel tubing ½ in. thick, in sections 40 ft. long, two sections being welded together at the bridge site and provided with a conical cast-steel shoe to form an 82-ft. pile.

After being driven by a floating pile-driver into an underlying sand stratum and cut off at the required top level, the tube was filled with concrete in one continuous pouring, reinforced with 1¼-in. square bar reinforcement left projecting at the top to bond with the capping girder reinforcement. Additional reinforcement of similar bars also was used at the top of each pile to strengthen the bonding with the cap. This type of pile was selected as being light for handling and driving in the tubular form, and very strong as a column with its reinforced concrete filling.

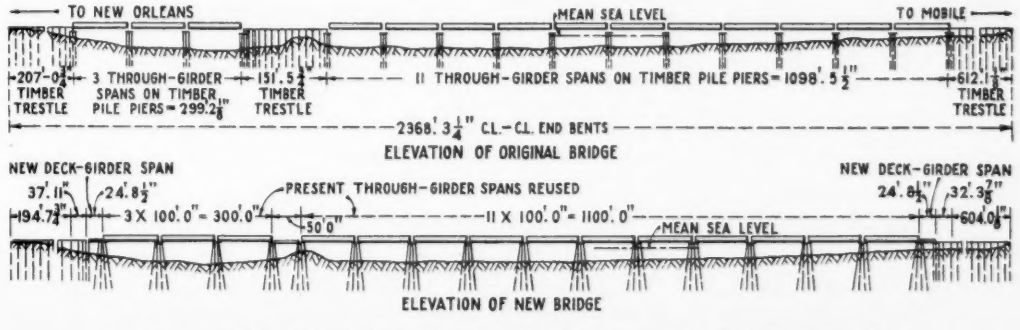
The 16 piles in each pier were driven in two groups of eight, one group at each end of the pier arranged as the illustration shows, and all piles were driven as rakers with batters varying from 1½ in. to 2 in. to a foot. This arrangement secured a large foundation base, as the batter is both longitudinal and transverse, and may be seen from the drawing; resistance to transverse wind and water pressure and to longitudinal traction forces is also effectively provided by this two-way A-frame design.

The pier cap was poured continuously without construction joints into shuttering hung from the pile tops, and consists of 86 cu. ft. of concrete, reinforced to act as a beam between the two pile clusters.

Method of Moving the Spans

In planning the longitudinal movement of the spans, opportunity was taken to eliminate the 150-ft. mid-stream trestle viaduct and replace it by a single 50-ft. girder span, as shown in the diagram of the new bridge in elevation. This enabled the three 97-ft. main spans at the New Orleans end to be moved inwards about 50 ft. and the eleven remaining main spans to be similarly moved inwards, or in the opposite direction. The approach viaducts were extended with new deck girder spans to suit this rearrangement of the main spans.

This actual movement was effected, one span at a time, by placing specially-strengthened steel barges alongside the span to be moved, with two pairs of 92-ft. × 36-in. steel beams passed under the span after jacking up. Each pair of beams constituted a temporary transverse span, the two beams being at about 12-ft. spacing and tied together with a system of lateral bracing; the two pairs were spaced at 36 ft. 4½ in. centres on each barge, from which they were packed up so that they would clear the pier tops. The total weight of each main span so lifted and moved with bearings, decking, and permanent way, was 120 tons. As each span was moved about 50 ft. inwards, towards the bridge centre, a temporary girder span of this length, complete with track, was inserted behind it to complete the bridge and



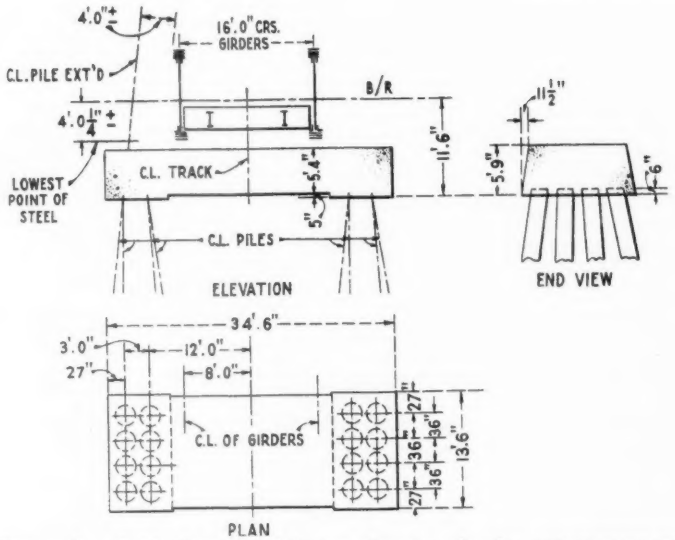
Elevation of the bridge: (above) as originally constructed and (below) as rebuilt

to enable traffic movement to be resumed. The group of 11 main spans was the first to be moved inwards in succession, beginning with the innermost one, or that nearest to the New Orleans end. Subsequently, the three spans at the New Orleans end were moved similarly, though in the opposite direction. The actual movement was effected by means of a cable from a locomotive crane on the track.

To make these successive operations possible, the timetable was revised slightly, so as to permit the engineers to occupy the line for a three- or four-hr. period in daylight for each operation.

Piledriving began in April, 1947, and the entire substructure, including the 16 new piers, was completed in November of that year. The work of moving the spans began on January 6, 1948, and proceeded until February 5, when heavy traffic in connection with the Mardi Gras celebration at New Orleans necessitated a 10-day halt. Two days' further work enabled the undertaking to be completed on February 18.

The work was carried out under the general supervision of Mr. C. H. Blackman, Chief Engineer, L. & N.RR., and the design and execution of it was entrusted to Mr. C. K. Bruce, the company's Associate Bridge Engineer. The new piers were constructed under contract by the Maxon Construction Company of Dayton, Ohio, but all other work was done departmentally by the railway engineers. We are indebted to our American contemporary *Railway Engineering Maintenance* for these details and also for the illustrations accompanying them.



Plan, end, and side elevation of the top of a pier, showing arrangement and batter of piles in clusters, and the massive concrete slab capping girders

Long Rails in South Africa

*Despite early experimental failures the South African Railways are now adopting 480-ft. and 960-ft. welded rails**

THE long rail is not a new idea in South Africa, as the first continuous rail, three miles in length, was put into the track of the Lynchburg-Durham Railway as far back as 1889. A railway engineer conceived the idea of riveting 56-lb. rails together into a three-mile length and burying the sleepers in the ground. Contraction and expansion caused no trouble, but the sleepers, being buried, soon deteriorated, and the experiment was not repeated. This decision was unfortunate, as it was later found to be unnecessary to bury the sleepers, provided there was adequate stone ballast and efficient fastenings.

In the early days in South Africa, the old Cape Government Railways rails, some dated 1880 and still in use, were 24 ft. and 30 ft. in length. Later, B.S.S. rails 33 ft. and 40 ft. were used, and these remained the standard until very recently. In fact, many miles of main line still have 40-ft. rails. In 1935, Iscor (the South African Iron & Steel Industrial Corporation Limited) rolled the first 60-ft. rails and these are still the longest rails direct from the rolling mills. In 1936, 80-ft. and 120-ft. thermit-welded rails were tested on the Natal main line and also at Witpoortjie, near Johannesburg. The first flash-butt-welded rails, 120 ft. in length, were put into the Natal main line near Elandslaagte in 1938.

Then, in 1939, came the first real long experimental rail, one mile in length. The track was, however, of special construction in that two secondhand rails of the same length were secured to the bottom of the sleepers to ensure lateral stability. The rail was made up of 120-ft. flash-butt-welded rails which were then thermit-welded, on the site, in two rails each a mile long. They were removed from the track in 1946, due to failure of some of the thermit-welded joints. This track gave no trouble due to expansion, but was hardly an economical proposition.

The first type of welded track for 60-lb. rails was put into the Marble Hall line in 1934, about a year after the experimental installation of 2,700-ft. rails by the Delaware & Hudson Railroad in America. The 60-lb. track was not the usual welded rail, but merely had the fishplates welded to the crown and flange of the rail. The bottom of the flange was also welded and all fishbolts were tack-welded. This track was an economical proposition at the time, as short C.G.R. rails were welded into lengths of 63, 69, and 72 ft. These welded joints have since failed and have been replaced by standard 60-lb. rails.

An improved form of welded rail was then tried out on the South West Africa System between Prieska and Upington. There, the head of the 60-lb. rail had a "V" cut out at the joints and then welded solid. The flanges had a soleplate welded on underneath, and the fishplate and fishbolts were welded as on the Marble Hall line. These rails stood for about ten years, but are now being replaced by 120-ft. flash-butt-welded rails.

In 1946, a mile of 480-ft. (96-lb.) rails were put in on the Natal main line near Roodekop and are still under test. These rails are laid on steel sleepers (2,112 to the mile) with ballast at 2,000 cu. yd. a mile. In August, 1948, two further 480-ft. experimental 96-lb. rails were laid abutting on the previous mile length. These rails are laid on 7 ft. × 10 in. × 5 in. hardwood sleepers, with cast-iron chairs and steel keys, at 2,376 a mile, and ballast at 2,200 cu. yd. a mile. These rails are staggered a distance of 6 ft. 11¾ in. Immediately following this pair of rails are two 960-ft. (96-lb.) staggered rails laid on 2,376 steel sleepers a mile, and ballast at 2,200 cu. yd. a mile. This represents a Class 1 track, the highest classification in the Union. These rails were made up of 120-ft. butt-welded rails, later arc-welded into long lengths on the site.

The reason for staggering the joints is to obtain better riding qualities and to obviate welded joints coming opposite one another. In this connection it can be stated that the 120-ft. (96-lb.) rails (staggered 6 ft. 11¾ in.) on the Esselen Park-Olifantsfontein section (between Pretoria and Johannesburg), where speeds of 60 m.p.h. are run, give comparatively silent running and greater comfort.

In order to lay the 480-ft. and 960-ft. rails on a single line, total occupation of the line was arranged from 10.40 a.m. to 12.20 p.m. on August 23, 1948. Actually, the work was completed by 11.55 a.m. and the first train passed over at 12.05 p.m. It took about fifteen minutes to put in a 960-ft. rail. Before the passage of the last train and prior to taking occupation, 50 per cent. of the fishbolts were loosened as well as four out of five clip bolts on the steel sleeper section. After the passage of the last train the remaining fastenings were loosened and the 40-ft. rails thrown out.

The rails were laid at an average rail temperature of 80° F. This is somewhat higher than intended, but was unavoidable as occupation had already been arranged and everyone was on the job. Before the rails were fastened, the correct expansion at the joint was secured by inserting a one-eighth-in. shim, and then using a creep-puller to pull the long rail right up against the shim. The creep-puller can pull 1,320 ft. of 96-lb. rail in one operation. As the Esselen Park section was laid at a temperature higher than calculated, it may be necessary later to adjust the rails.

Careful records are being kept of the behaviour of these rails, as well as the

(*Continued on page* 163)

* Abstract of an article by A. F. Bruyns-Haylett, B.Sc., in the *South African Railways & Harbours Magazine*

Ocean Train-Ferry Pier on 200-ft. Piles

Pier founded on H-section steel piles driven through mud from 90 to 190 ft. deep to bedrock and having an independently-supported double-cantilever gantry crane for transhipping freight cars

General view of pier and gantry crane loading or unloading freight cars into two Seatrain vessels simultaneously

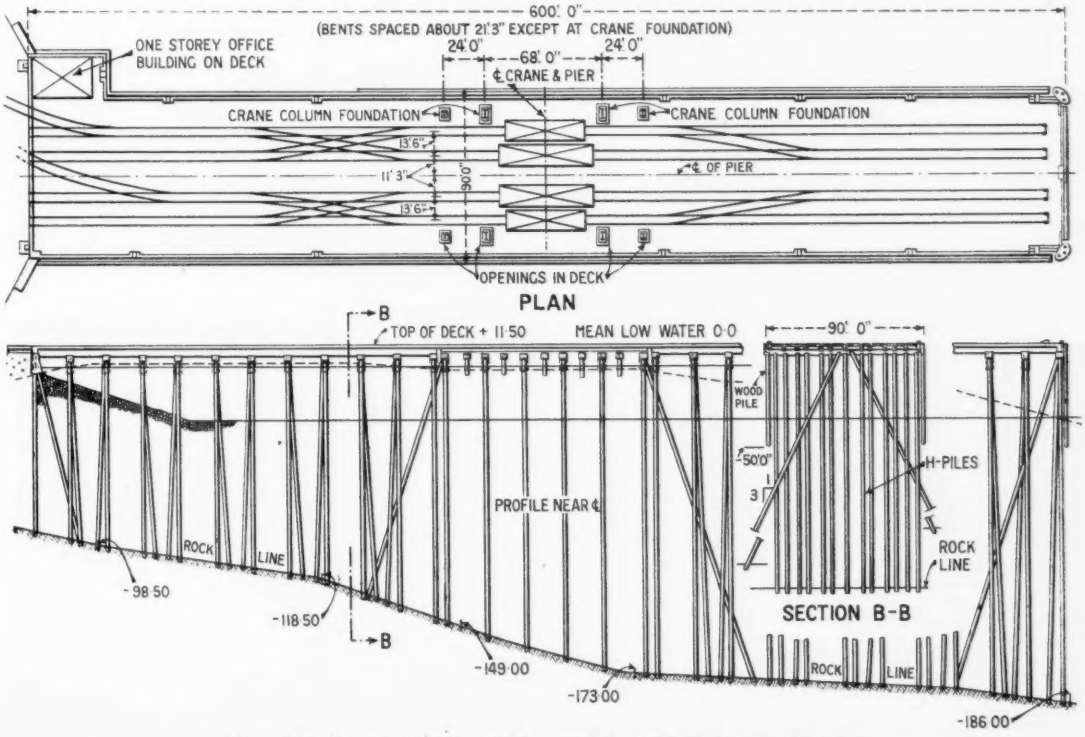
THE New Jersey shore of New York harbour is far from ideal for pier construction, by reason of its bed, which consists of a black, clay-like silt, mixed with organic matter and extending to great depth before solid foundation is reached; this mud bed stretches out to mid-channel. Consequently, when Seatrain Lines Incorporated decided to build a pier for transhipping freight cars to its ocean-going train-ferry steamers, there was the prospect of driving piles for its support through a depth of from 90 to 190 ft. of this soft mud, before a stable foundation could be reached. Moreover, the piles not only had to carry the pier 600 ft. long and 90 ft. wide, with its four railway tracks, but also a large gantry-type double-cantilever crane for lifting the freight cars from the pier to the ferry steamers, on both sides of it, and *vice versa*. Very stable foundations, therefore, were essential. From the first, it was realised that the piling for the crane foundations would have to be driven to rock bed, but the most economical form of foundation for the pier, apart from the crane, had to be considered.

Experience elsewhere in this neighbourhood had shown that wooden piles depending on skin-friction in the mud for their stability were ineffective; so for the pier also there appeared to be no alternative but to drive either timber, tubular-steel, or H-section steel piles the full depth to rock bottom. Estimates indicated that the first cost of timber piling would be about 5 per cent. lower than with H piles, but the supply of timber was uncertain, and there were many reasons why the latter type of piling was the most suitable of the three. There was bound to be a wide fluctuation of stresses in the piles from tension to compression, and from the decking down to the surface of even the soft mud, there would be an unbraced length of 38 ft. in each pile. Furthermore, the H piles could be driven very easily through the silt, and, when the pile-tip reached stable bed, a sufficient penetration into its disintegrated rock was assured for adequate end-bearing, without recourse to special reinforcement or pile tips.

Other considerations were safety from fire, maintenance costs, permanence of the structure, and speed of construction. Everything pointed to the use of H piling, and therefore it was used for the sub-structure, together with heavy reinforced concrete capping girders, stringers between the pile-bents, and decking.

Transhipment Crane Foundations

The foundations for the crane were eight pedestals consisting of concrete-encased pile clusters, constructed independently of the pier, though surrounded by it. In fact, the pedestals project through holes in the pier decking, and there is a 9-in. gap all round between pedestal and deck. This safeguards the crane structure from damage in the event of a collision between a



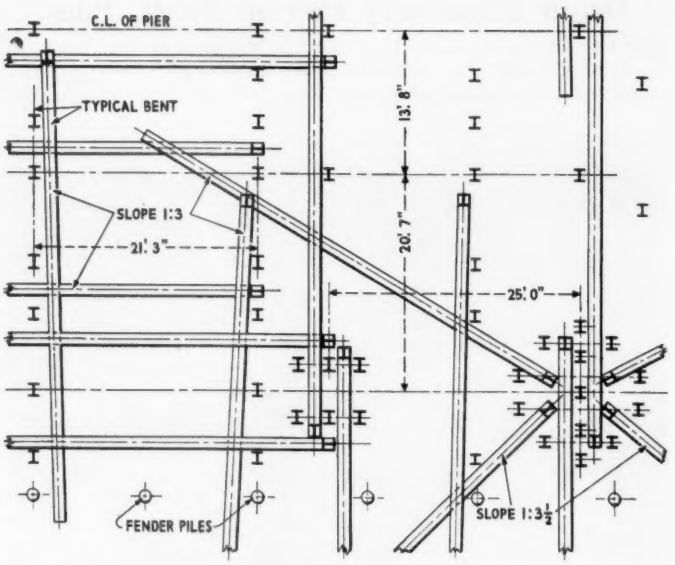
Plan, elevation, and section of pier, omitting pile clusters under crane

vessel and the pier. The pedestals are tied together beneath the deck.

The section of pile selected for use throughout the job is a 14-in. steel joist or beam, weighing 89 lb. per ft. The piles carrying the pier were driven in transverse bents or rows, each of 13 piles; their spacing was arranged so that there is a pile directly under each of the track rails. The bents are 21 ft. 3 in. apart longitudinally to the pier. Heavily reinforced 3-ft. × 3-ft. concrete girders cap the pile-bents, and 13 reinforced-concrete stringer girders, 3 ft. 3 in. deep, including a slab decking 10-in. thick, span the gaps between the bents.

The eight stringers under the rails are 2 ft. wide, and the other five are 18 in. wide. The constructional design can be seen in the accompanying illustrations, for which, with other details, we are indebted to our American contemporary, *Engineering News-Record*. The rails are of the tramway type and weigh 128 lb. per yd.; they are let into recesses in the concrete forming the combined decking and head of the stringers, so that rail-head is flush with deck level, to facilitate road-vehicle traffic on the pier.

The transhipment crane is at the centre of the pier, and the ends of its cantilevers project 75 ft. beyond the berthing faces on each side of the pier. Loaded or empty freight cars thus can be picked up by the crane, swung out transversely over the ships berthing alongside, and lowered through a large hatch amidships on to any of the four tracks, for distribution fore and aft on the four deck levels. As each of the four tracks on each deck accommodates an average of six cars, about 100 cars are carried by each ship.



Left: Arrangement of piles in half a typical bent. Right: Pile cluster and rakers under one corner of gantry transfer crane

Details of Construction Work

The entire construction work was completed with floating equipment, after preliminary work on the piles, fabrication of the concrete shuttering, and assembly of the reinforcing steelwork had been carried out in the contractor's yard before carriage to the pier site by barge.

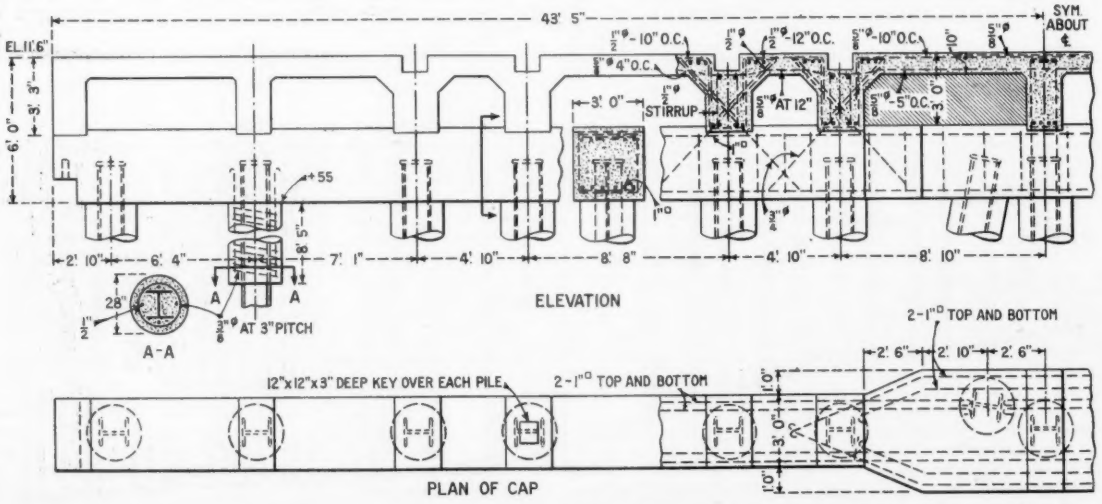
As 23 out of the 29 13-pile bents are alike, the contractor produced an ingenious time-saving device for spotting all the 13 piles in each bent at a single setting of the pile rig. Along one side of an old barge, 13 timber leads were rigged at the required spacings. These leads were 45 ft. high and were of 12-in. × 6-in. timbers, with 10-in. × 6-in. back-leg bracings. The barge also carried the boiler for pile-driving and plant for welding the long piles.

A floating crane which placed the piles in their leads had a boom 103 ft. long and was capable of handling piles up to 130 ft. in length. Longer lengths were made up by weld-splicing. Usually, the piles sank under their own weight and had to be stopped at barge-deck level for welding, the pile being held at that level meanwhile. Some, however, had to be forced down by driving. The same floating crane also moved the pile-driving hammer from place to place. Pile-setting, -welding, and -driving into the rock were scheduled so as to ensure the continuous work of all the units.

For transverse rigidity in the pier piles, one raking pile was driven in each direction at each bent, the raking angle being from 1 in 3 to 1 in 3½. This variation was found necessary in avoiding other piles in some cases. Round each of the four main crane-supporting pile-clusters of 13 piles, six raking piles were driven, as shown in one of the illustrations. For driving, the raking piles were set on a frame inclined at 1 in 3½, which was light enough to be handled by a medium-size floating derrick, and was set on vertical piles for driving the rakers. Each raking pile was allowed to slide down the frame as far as it would go under its own weight, and then was driven by a hammer also laid on the frame slide, down which it followed the pile head. To give a 1 in 3 or 1 in 3½ rake, the frame was tilted by blocking up.

Piles Protected by Concrete Casing

All the vertical and raking piles in the riverward half of the pier, and all the crane pile clusters, were encased in con-



Reinforced-concrete deck and pile capping at outer end of pier where piles are encased in concrete. Hatched space between deck and cap is poured solid for greater rigidity

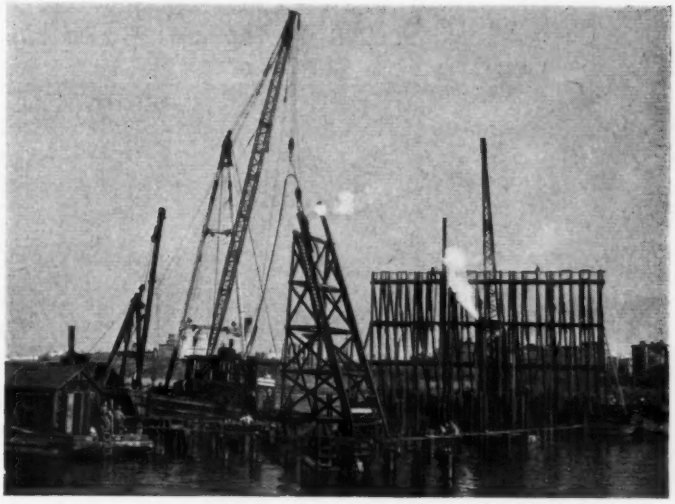
crete down to a depth of 3 ft. below mean low water level. As a measure of economy in capital outlay, the remaining piles, numbering about 200, have no protective concrete coating.

The shuttering for the capping and stringer concrete girders and for the deck slabs was supported on heavy timbers, and the reinforcement was placed by floating cranes. Aggregate was delivered by barge to a floating mixing plant, and the mix was raised in a tower hoist and poured into position. Quick-setting cement was used throughout. Oak fender piles are provided at 10 ft. 7½ in. intervals and have continuous capping timbers. Two rows of fender piles, which are arranged radially in plan, protect the corners of the pier.

Land-to-Pier Connection

One of the worst problems connected with this work was the provision of an abutment at the shore end of the pier and a stable approach-bank behind, with nothing but a considerable depth of soft mud on which it could be founded. However, a concrete abutment wall has been built on vertical master and raking piles driven at 5 ft. 6 in. centres. To each master pile was welded a half-section of sheet piling, and intermediate connecting sections of sheet piling then were driven. So that the locking between these sections of piling should be in tension when the approach bank rested against them, they were arranged in a slight arc towards the river.

The top of all piling is embedded in the abutment wall. It was found impossible to form a stable fill, however, and movement is likely to continue for some time. Consequently a temporary timber viaduct has been constructed to carry the tracks from solid ground inshore, across to the pier.



In the foreground is a pile-driver, resting on piles, driving a raking pile for one of the crane clusters. In the background is the 13-lead battery mounted on a barge for driving the vertical pier piles

The design and supervision of the work were entrusted to Messrs. Harder, Barbato and Ciampa under the direction of Mr. Felix A. Ciampa, and the pier was constructed by J. Rich Steers Incorporated. The transhipment crane was designed and erected by the American Bridge Company. Mr. Graham M. Brush, President of Seatrain Lines Incorporated, was responsible for the over-all general design and construction of the special ferry vessels, transhipment arrangements, and pier.

In an editorial note in this issue, the ocean train-ferry operated by Seatrain Lines Incorporated, is briefly described, and the design of the pier is discussed.

A Rail Flaw Detector Car

A self-propelled machine using a supersonic device is now in use on the New South Wales Government Railways

A CAR for locating faults in railway tracks, which should reduce the accident risk from deformed and broken rails, has been developed by a New South Wales engineer.

The machine, a dual-function unit, indicates the approximate area of any track fault through an electro-magnet, and a supersonic device, using vibrations travelling at a speed higher than sound, records the exact nature of the damage. Thus the operator can tell quickly what repairs are needed or if the sections should be replaced.

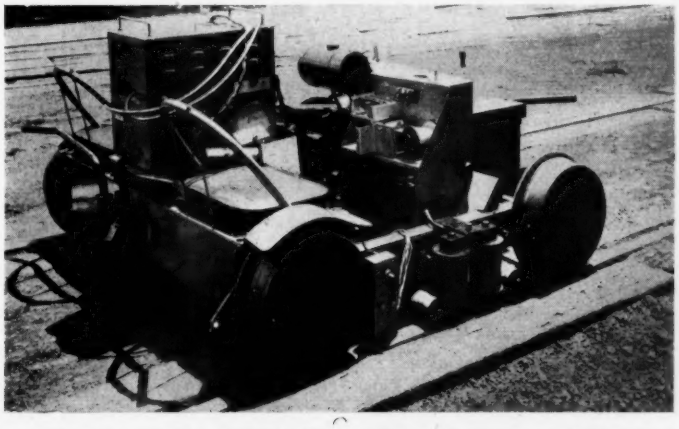
According to Australian rail experts, no device using similar principles of visual recording of mechanical vibrations reflected from a fault area has been produced elsewhere.

The flaw detector car is self-propelled, and weighs about a quarter-of-a-ton. Magnetic instruments quickly locate suspicious spots in the track, after which the supersonic instruments check those spots and show the size, position, and type of any flaw.

The preliminary examination of the track is carried out while travelling at a speed of up to 15 m.p.h. The equipment used in this stage of the tests consists of four main parts, an electric magnetiser, a pick-up coil, an amplifier, and a recorder.

As the magnetiser passes over the rail, it leaves a residual field which shows up differently over a fault than over a sound section. The pick-up coil moving in this field detects the difference, which is amplified and recorded on a tape.

Immediately a defect shows up, the car is stopped and it is examined with the supersonic equipment, which comprises a synchroniser, a driver, an amplifier, probes and an oscilloscope. A pulse of mechanical vibrations is injected at an appropriate frequency into the rail, and, after travelling some distance, it is reflected by the fault. This reflected energy is picked up and displayed on the oscilloscope.



Detector car for the New South Wales Government Railways

More Machines on Order

When a rail is shown to have a hidden flaw in the head, it is immediately removed from the track. Recently, 24 such rails were detected in an examination of a 442-mile length of track. At present there is only one machine in use, but four others are being built which will enable the rails on the New South Wales main lines to be examined twice a year. The more important branch lines will be inspected once a year, and the rails on branch lines over which the traffic operates at a low speed will be examined once every two or three years.

Scenes on the Swiss Federal Railways

During the months when the highest mountain roads of Switzerland are snowbound, the Swiss Federal Railways transport many thousands of cars on specially-constructed wagons through the tunnels on the Gotthard and Simplon electrified lines

In 1902 the Swiss Federal Railways took over 516 km. of double track. Since then, 610 km. have been laid, and now nearly 40 per cent. of the network is double track. (See editorial article in our January 21 issue)

Photos] [*" The Swiss Federal Railways Today "*

RAILWAY NEWS SECTION

PERSONAL

Mr. John Elliot, Chief Regional Officer, Southern Region, British Railways, has been invited by the Government of Victoria to report generally on the Victorian Government Railways. The Railway Executive, with the concurrence of the British Transport Commission, has agreed to release Mr. Elliot for a period of three months, and he will leave England for Australia by air on March 2. In his absence, Mr. R. M. T. Richards, Deputy Chief Regional Officer, will be in charge of the Southern Region, and will be assisted by Mr. H. A. Short, Chief Officer, Railway Executive. Mr. Elliot is being accompanied by Mr. A. C. J. Payne, Principal of the Southern Region Staff Training College.

Railway Executive Appointments

The following appointments are announced by the Railway Executive:—

Mr. H. B. Everard to be Chief Officer, Engineering (Maintenance).

Dr. F. F. C. Curtis to be Architect.

Mr. J. L. O'Connell to be Chief Horse Superintendent.

Mr. Henry Brooke (formerly Deputy-Chairman of the Southern Railway Company) has joined the board of the United Kingdom Provident Institution.

The late Mr. Arthur Towle, who was Controller of L.M.S.R. Hotel, Refreshment Room & Restaurant Car Services from 1925 to 1944, left £16,869.

Mr. F. W. Baker, Chief Cashier, London Midland Region, British Railways, has retired. A portrait and biography of Mr. Baker appeared in our issue of April 23 last.

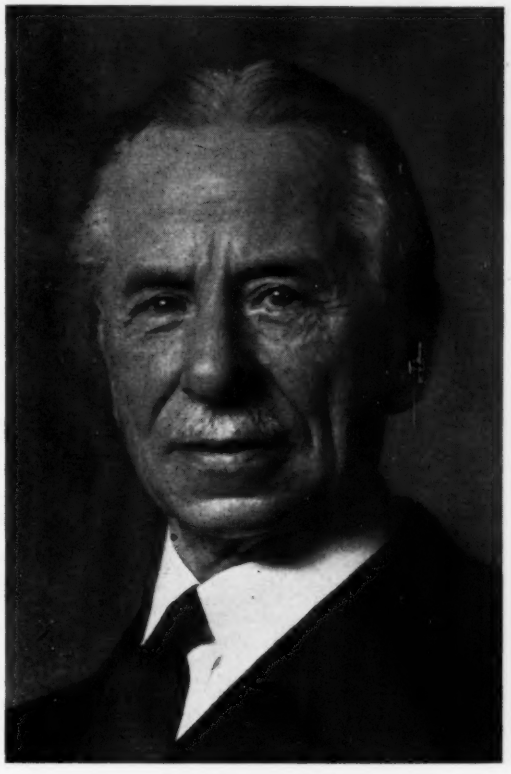
Mr. S. F. Kneller, Deputy Chief Officer (General Haulage), Road Transport Executive, has been made a Liveryman of the Carmen's Company.

Mr. G. K. Tatterson has resigned from the position of Assistant District Operating Superintendent, Crewe, London Midland Region, British Railways, and has taken up the appointment of General Transport Manager, John Summers & Sons, Ltd., Hawarden Bridge Steel Works, Shotton, Chester.

Mr. Cyril G. C. Wayne, formerly Assistant Traffic Manager, Buenos Ayres Great Southern and Western Railways, has been appointed Traffic Investigation Officer, Tasmania Government Railways.

Mr. K. D. M. Spence has been appointed Commission Counsel for the Canadian Pacific Railway, and will specialise in matters before the Board of Transport Commissioners for Canada, and the Interstate Commerce Commission.

Mr. Duncan Bailey, O.B.E., M.I.Mech.E., who, as recorded in our January 14 issue, has resigned his position as Joint Managing Director of Charles Roberts & Co. Ltd., Wakefield, but, at the request of the board, retains his position as Chairman, has served the company for 49 years, 32 of them as Managing Director. He was appointed Chairman in 1927. Mr. Bailey was born in 1875, and was educated at King Charles I Grammar School, Kidderminster. In 1890 he joined the Birmingham Railway Carriage & Wagon Co. Ltd., as a junior in the Works Manager's Department, under the late Mr. Nicholas Retallack. From 1892 to 1899 he served with the Gloucester Railway Carriage & Wagon Co. Ltd., and was sent out by that company to Umtali with the first four railway carriages for the Mashonaland Railways. Returning to this country, he was appointed by Charles Roberts & Co. Ltd. as Assistant General Manager, and he has remained with that company ever since. He was made General Manager in 1911, Managing Director in 1916, and Chairman in 1927. He resigned as Joint Managing Director on December 31 last, but retains his position as Chairman. Mr. Bailey has held many offices in connection with the private wagon-building trade, and has served on various committees. He was President of the Wakefield Chamber of Commerce & Shipping from 1921 to 1927. For special work during the 1914-18 war he was made an O.B.E., and his son, Mr. Russell Bailey, who succeeds him as Managing Director of Charles Roberts & Co. Ltd., was awarded a similar honour in the recent New Year Honours.



Mr. Duncan Bailey

Who has resigned his position as Joint Managing Director of Charles Roberts & Co. Ltd., but remains Chairman of the company

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Sir Charles Tennyson has retired from the Chairmanship of the Industrial Art Committee of the Federation of British Industries; he has held that position continuously since its inception in 1920. Mr. Ernest W. Goodale, a member of the committee and of the F.B.I. Grand Council, succeeds Sir Charles Tennyson as Chairman.

Mr. S. J. B. Skyrme has been appointed Chief Engineer, East Midland Motor Services Limited, in succession to Mr. D. F. C. Hill, appointed Chief Engineer, North Western Road Car Co. Ltd.

Mr. H. E. Bristow, Head Draughtsman, C.M.E. Department, Stratford, Eastern Region, British Railways, and Mr. M. J. Donovan, Chief Mechanical Engineer, Lima Locomotive Works Division, Lima-Hamilton Corporation, Ohio, have been elected Members of the Institution of Locomotive Engineers.

Dr. H. I. Andrews, a member of the Engineering Section, Scientific Research Department, London Midland Region, has been awarded the George Stephenson Prize for 1948 by the Institution of Mechanical Engineers for his paper: "The Mobile Locomotive Testing Plant of the L.M.S.R."

Monsieur Arthur Haulot, High Commissioner for Tourism in Belgium, held a reception at Belgium House, London, W.1, on Tuesday last, in connection with the recent Anglo-Belgium Agreement giving facilities for British tourists to visit Belgium.

Mr. Gerald Leedam

In our December 10 issue we announced that Mr. Gerald Leedam, for many years Secretary & Manager of the Cheshire Lines, proposed to retire this month. On February 4 he was the guest of honour at a luncheon arranged by the officers of the London Midland and the Eastern Regions. Mr. G. L. Darbyshire, Chief Regional Officer, L.M. Region, presided, and congratulated Mr. Leedam on his success in carrying on the work of the Cheshire Lines in a manner which had given complete satisfaction to the parent companies; he added a word of thanks for his helpful co-operation over the transfer of the joint undertaking to the London Midland Region. Mr. Darbyshire asked Mr. Leedam to accept a silver salver as a mark of the esteem in which he was held. Mr. C. K. Bird, Chief Regional Officer, Eastern Region, Mr. V. M. Barrington-Ward, Member, Railway Executive, and Mr. R. Bell, formerly Assistant General Manager, L.N.E.R., spoke briefly in support.

Mr. H. G. Lakeman

Appointed Divisional Engineer, Cardiff, Western Region, British Railways

Mr. J. R. Dallmeyer

Appointed District Engineer, Hull, North Eastern Region, British Railways

Mr. C. J. Foster

District Goods & Passenger Manager, Perth, L.M.S.R., and Scottish Region, 1940-49

Mr. H G. Lakeman, B.Sc., A.C.G.I., A.M.I.C.E., who, as recorded in our January 28 issue, has been appointed Divisional Engineer, Cardiff, Western Region, British Railways, received his technical education at the Imperial College of Science & Technology, University of London, taking an honours degree. He entered the service of the Great Western Railway in the Divisional Engineer's Office, Plymouth, in 1923, where he was engaged on various new works in Cornwall. In 1927 he was transferred to the Resident Docks Engineer's Office at Barry. Mr. Lakeman subsequently occupied the post of Assistant in charge of Port Talbot Docks and Cardiff Docks, and in 1939 was appointed Assistant Divisional Docks Engineer at Barry Docks for the eastern area group of ports. In February, 1945, he was transferred to Newport as Assistant Divisional Engineer, which post he vacates on his present appointment.

Lt.-Colonel W. T. Everall, O.B.E., creator of various types and usages of standard military railway bridge spans and trestling used by the Allies in the recent war, has been awarded the Order of Chevalier de la Légion d'Honneur by the President of the French Republic. In his letter conveying the President's wishes, the French Ambassador refers to the important part taken by Colonel Everall in the realisation of the artificial port of Arromanches; this relates to the design of the special spans, pontoons and other features of the flexible seaward piers or roadways used in the Mulberry harbours, and to the train-ferry equipment designed by him for transporting locomotives and rolling stock and unloading them at several damaged ports on the Continent. Some of the post-war uses to which standard military railway bridging material is being put are referred to on page 142.

Mr. J. R. Dallmeyer, B.Sc., M.I.C.E., who was recently appointed District Engineer, Hull, North Eastern Region, British Railways, was educated at Loretto School and Leeds University. He served as Midshipman, R.N.V.R., from 1918-19. Mr. Dallmeyer joined the North Eastern Railway at York in 1921 as a pupil, and transferred to the Southern Railway at Waterloo in 1923. He joined the Palestine Railways as Assistant District Engineer in 1926, and was stationed at Lydda, Haifa, and, for a short time, at Amman. He returned and joined the L.N.E.R. at Kings Cross in 1936. In 1939 he became Parliamentary & Surveying Assistant, and in 1942 was made District Engineer, Ipswich, the post he vacated to take up his present appointment.

CREMATION SERVICE FOR MR. A. MAYNARD

The cremation took place at Croydon Crematorium on February 3 of Mr. A. Maynard, Chief Goods Manager, Great Western Railway, from 1931 to 1942, who died on January 29. Among those present at the service were:

Mr. David Blee, Member, Railway Executive.

Western Region: Messrs. C. Furber, Commercial Superintendent, representing Mr. K. W. C. Grand, Chief Regional Officer, also representing Sir Felix Pole and Sir James Milne, former General Managers, G.W.R.; S. C. Rowe, representing Mr. F. R. E. Davis, former Secretary, G.W.R.; J. F. Cole, representing Mr. Gilbert Matthews, Operating Superintendent; J. O. Jones, representing Mr. A. S. Quartermaine, Chief Engineer; A. Lane, Chief of Police; G. S. Halliday, Road Motor Engineer; T. H. Hollingsworth, Principal Assistant to Commercial Superintendent, representing Mr. A. W. Woodbridge, Signal & Telegraph Engineer; J. F. Anstey, District Goods Manager, Shrewsbury; R. G. Barefoot, former District Goods Manager, Bristol, G.W.R.; A. F. E. Belcher, Commercial Superintendent's Office; A. Bond, former Assistant to Commercial Superintendent; W. Griffiths, representing R. A. Ryan, District Goods Manager, Swansea; J. Horsley, District Goods Manager's Office, London; H. J. Hoskins, former District Goods Manager, London, G.W.R.; H. W. Howard, Assistant to Commercial Superintendent; T Martin, former District Goods Manager, Liverpool, and A. S. Mills, former District Goods Manager, London, G.W.R.; H. H. Starr, District Goods Manager, London; J. M. Wildsmith, former District Goods Manager, Newport, G.W.R.; A. Twist, former Horse Superintendent, G.W.R.

Messrs. J. Wildman, representing Mr. W. P. Bradbury, Chief Commercial Manager, London Midland Region also Messrs. R. Bagwell, E. Dawson, F. Grundy, A. J. Rice, L.M. Region; H. B. Webster, former Rates & Charges Assistant to Chief Commercial Manager, L.M.S.R.; C. Johnstone, former Assistant Chief Commercial Manager (Passenger), L.M.S.R.; W. M. Perts, former Commercial Superintendent, Southern Railway; W. J. Amies, Railway Clearing House; C. E. R. Sherrington, Secretary, Railway Research Service; S. Lovell, C. Shaw Lovell & Sons Ltd.; F. W. Tipton, Thames Steam Tug & Lighterage Co. Ltd.

Mr. C. J. Foster, who is retiring from the position of District Goods & Passenger Manager, Perth, Scottish Region, British Railways, joined the Caledonian Railway in 1902 in the District Superintendent's Office at Glasgow. In 1912 he was appointed Train Inspector, and on the amalgamation in 1923 became Assistant Divisional Controller (Passenger Services) in the General Superintendent's Office, Northern Division, L.M.S.R. Mr. Foster was made Outdoor Assistant to the Divisional Operating Manager, Northern Division, in 1932, and from that year to 1937 was a member of the Rules & Regulations Sub-Committee at the Railway Clearing House. In 1937 he was appointed Divisional Controller (Passenger Services), Northern Division, which position he relinquished two years later to become District Goods & Passenger Manager, Inverness. He was appointed to the corresponding post at Perth on December 1, 1940.

SIXTY-THREE YEARS IN LOCOMOTIVE ENGINEERING

At a recent gathering of members of the staff of W. G. Bagnall Limited, a cheque, to which all his fellow-workers had subscribed, was presented to Mr. F. H. B. Harris, who has just celebrated his 78th birthday, and has worked for 63 years in the locomotive engineering industry. Although he relinquished his position as Chief Draughtsman some months ago, he has since continued with the company in an advisory capacity. Mr. Harris began his career at the age of 15, serving a five-years apprenticeship with the firm of Hartley, Arnoux & Fanning, of California Works, Stoke-on-Trent. He joined W. G. Bagnall Limited in 1932, and in 1937 became Chief Draughtsman. The presentation was made by the Managing Director of W. G. Bagnall Limited, Mr. Ian A. Marriott.

Ministry of Transport Accident Report

New Southgate, Eastern Region, British Railways: July 17, 1948

Lt.-Colonel G. R. S. Wilson, Inspecting Officer of Railways, Ministry of Transport, inquired into the accident which occurred at about 6 a.m. on July 17, 1948, in the short tunnel north of New Southgate. As the 7.50 p.m. express, Edinburgh to Kings Cross, consisting of 11 bogie vehicles, weighing 362 tons, and drawn by "A2/1" class 4-6-2 locomotive No. 60508, *Duke of Rothesay*, was passing through the tunnel, the trailing bogie wheels of the engine became derailed. The leading wheels of the bogie also became derailed on reaching a V-crossing, 689 yd. ahead, outside the tunnel, and this destroyed the track, resulting in the whole train leaving the rails. The engine broke away, turned over, slid on its side for about 100 yd. through an overbridge, and came to rest 1,145 yd. from the initial point of derailment.

The fireman was killed, but there were no serious casualties in the train, although the leading vehicle was overturned and considerably damaged. One passenger was detained in hospital for two days, and nine others sustained minor injuries, or shock. The driver was slightly injured. The signalman at the Cemetery signal box sent "obstruction danger" on all four lines, at once, and telephoned to Control. Assistance was summoned and speedily arrived. It was possible to re-open the down fast line 20 min. after the derailed engine and coaches had been cleared at 8 p.m., but not the up fast until 6 p.m. on July 18. Normal working then was resumed, with hand signalling replacing the destroyed Cemetery up starting signal gantry.

The weather was fine and clear. The accompanying plans and diagrams provide details of the site and layout of tracks, essential to an understanding of the case.

From Potters Bar summit, the line descends towards London continuously at 1 in 200 for 8½ miles, with easy curvatures. Before the war, speeds up to 90 m.p.h. were attained, but there is now a general 60 m.p.h. limit on all lines south of Hatfield, 17¼ miles from Kings Cross. There is a summer weekday average of 100 movements, including 39 expresses, during 24 hr. on the up fast line. The initial derailment was in the middle of the three parallel Barnet tunnels, in which the up fast line was laid new in 1936, with 100 lb. B.S. rails and re-railed in 1944 with 95 lb. R.B.S. rails, in accordance with the usual life of 7 or 8 years for rails in this tunnel. Average weight had become approximately 83 lb. per yd. and complete renewal of track is planned for 1949. Each 60 ft. rail has 24 sleepers at standard spacing for the short 2-bolt fishplates. The tunnel is dry, except for two or three isolated places where water constantly drips from the roof. Ballast drainage is good, though, as is usual in tunnels, there is much dirt on the surface.

Colonel Wilson examined the track within 2 hr. of the derailment and 5 days later with the aid of special lighting. The first sign of derailment was 218 yd. from the tunnel entrance and consisted of a single light flange mark crossing the six-foot rail in a length of 15 ft. 10 in., preceded by a light scoring of the running edge. Its commencement was 5 ft. 4 in. ahead of a badly humped rail joint, close to which there were continual drips of water from the roof. This sharply elevated joint was very noticeable to the eye and the six-foot rail showed a run up of ¼ in. to the joint on a distance of 8 ft. 3 in., or a gradient of 1 in 132; run down was 1⅛ in. in 5 ft. 5 in., or 1 in 80. The end of the latter thus practically coincided with the commencement of the flange mark. Cess levels were about the same, so that there was no material difference of cross level over the distance; at the joint it was correct (zero cant).

The joint had been lifted and packed on July 11, in the course of routine repairs. String measurements taken 5 days after the accident showed that the hump had become slightly more pronounced under the traffic, which had been passing with 15 m.p.h. speed restriction, presumably because the two joint sleepers had been more firmly packed than those on each side of them. One or two joints in rear also appeared to be overpacked, but not nearly to the same extent.

Cross level for 200 yd. in rear of the joint was far from satisfactory. The greatest variation was in two rail lengths preceding the derailment. Rise in the cess rail was ⅞ in. in 30 ft. (1 in 411), followed by a drop of ½ in. in 30 ft. (1 in 480). Voidmeter readings showed no undue depression of sleepers under load. Sleepers and fastenings appeared sound throughout. Gauge in rear of the joint was constant at ¼ in. tight, at the joint it was ¼ in. tight, widening to ¼ in. slack in 13 ft., probably due to some inaccuracy in chairing at the depot. There was no sign of chair movement.

View of the wreckage after the accident at New Southgate, Eastern Region, on July 17, 1948

Engine and Train

The engine had run 36,500 miles since its last general repair in 1947. The bogie is of the side bearing type with lubricated bronze slides; no weight is taken at the central pivot. Side control is by coil springs, initially 4 tons and rising to 7 tons at maximum side displacement, disposed so that lateral wear is automatically taken up. No uncontrolled side-play can develop, apart from that due to wear of axlebox surfaces and wheel bosses. Rear axle is of radial type, with lubricated bronze Cartazzi slides. The engine had been in Darlington works for intermediate repairs only 5 weeks before, when the bogie was examined and weights adjusted to standard.

When Colonel Wilson examined the engine four days after the accident, he found the bogie undamaged structurally, but for a slightly bent frame plate. Bearing slides were in good condition and well lubricated. Detailed examination at Doncaster confirmed the satisfactory condition of tyres and flanges and all the engine wheels were found true on their axles. There was no undue side play. Laminated springs of the coupled axles were in good conditions.

Three of the bogie springs approximated to their standard deflection of 0·17 in. per ton, though several of their plates had old fractures, or cracks, at the cotter hole inside the buckle. In the left leading spring, however, six of the seven plates were broken in the buckle and it was weaker than standard with a deflection rate of 0·24 in. per ton. Such fractures are not uncommon in this type of laminated spring. The "A2" engines were designed and built when there was a general shortage of coil springs, which are preferred and used on Pacific engines of earlier or later L.N.E.R. design.

Course of Events

The marks and such-like on the permanent way made it reasonable to assume that the trailing wheels of the engine bogie became derailed to the right in the tunnel. The final position of the engine and coaches is seen in the plan.

The driver was thoroughly experienced at working expresses over the route and had driven the same train the previous day, but no high speed was attained when south of Potters Bar, due to signal checks. On the morning of the accident, the driver said he was coasting through the tunnel at about 60 m.p.h. He felt no unusual movement, apart from roughness of running always present there, nor was anything out of the ordinary noticed by the driver of the preceding express, travelling at a similar speed. No complaints of bad riding had been received that week, or previously. Driver and fireman heard a rattling noise as they emerged from the tunnel and realised

something was seriously wrong. The brake then was fully applied. Steam had been shut off at Hadley Wood, about 3 miles in rear; speed was then 60 m.p.h. and the driver thought it would not increase without steam on such a gradient. He was aware of the limit, but was anxious, apart from that, that speed should not rise too high, on account of patches of mist. No brake application was made until the emergency one. The signalman at New Barnet North, however, said the engine was steaming as it passed him, but did not think it was going much faster than the usual 60-65 m.p.h.

All signals had been clear for the train from Peterborough. A comparison of signal box records, both for this train and trains on previous days, although such cannot be taken as an accurate measure of speed over short distances, together with the position where the train stopped after the brake application, led Colonel Wilson to conclude that the engine appeared to have been gaining time steadily and that speed may have risen higher than the driver estimated, perhaps to 70 m.p.h.

Evidence Concerning the Track

The ganger, who was nearly 65 years of age, with 44 years' service, had been in charge of the length gang for 5 years. Its authorised strength is 5 men, including sub-ganger and himself. During the week before, one man had been away sick and the gang had been one under strength from February to May.

The ganger did not consider his length at all difficult to maintain, apart from a wet patch just north of the tunnel on the up fast. The foundation in the tunnel was good, although joints required packing from time to time. He had undertaken the routine quarterly examination and repair of the tunnel lines on July 11, with two additional men lent to him and under traffic. He had packed several joints, which he found a shade down. Although the ballast under the running on sleeper of the joint preceding the derailment, was wet from drips, it was not particularly troublesome and he could not recollect that it had required attention for some months. The acting sub-ganger, who had helped to open the joint on July 11, however, thought it required lifting fairly often and that the ballast on that day had not been as wet as usual.

The ganger explained that he finally left the joint about ½ in. high, so that it should settle down level as the packing was consolidated by the first few trains. This was his usual practice when repairing wet joints in the tunnel. They became level, or nearly so, by the Monday morning after Sunday repairs. He had not looked specially at this joint after July 11, but was confident it would have settled down. He appeared to be genuinely surprised that it was so high after derailment and could not suggest why it had not gone down. He was very regretful that he had not looked at it again, as he would have taken steps to lower it. He would not, however, have thought its condition unsafe for any speed which might be attained by up trains. He had not noticed the marked cross level irregularity in rear of the derailment. Some tests with the superelevation gauge on July 11 did not suggest that the up fast was noticeably out of level, but he had not had time to make a thorough check.

The permanent-way inspector, 13 months in this district, and his predecessor spoke well of the ganger's work, confirmed by 22 inspection reports over 5 years. The previous permanent-way inspector could not recollect that the ganger was in the

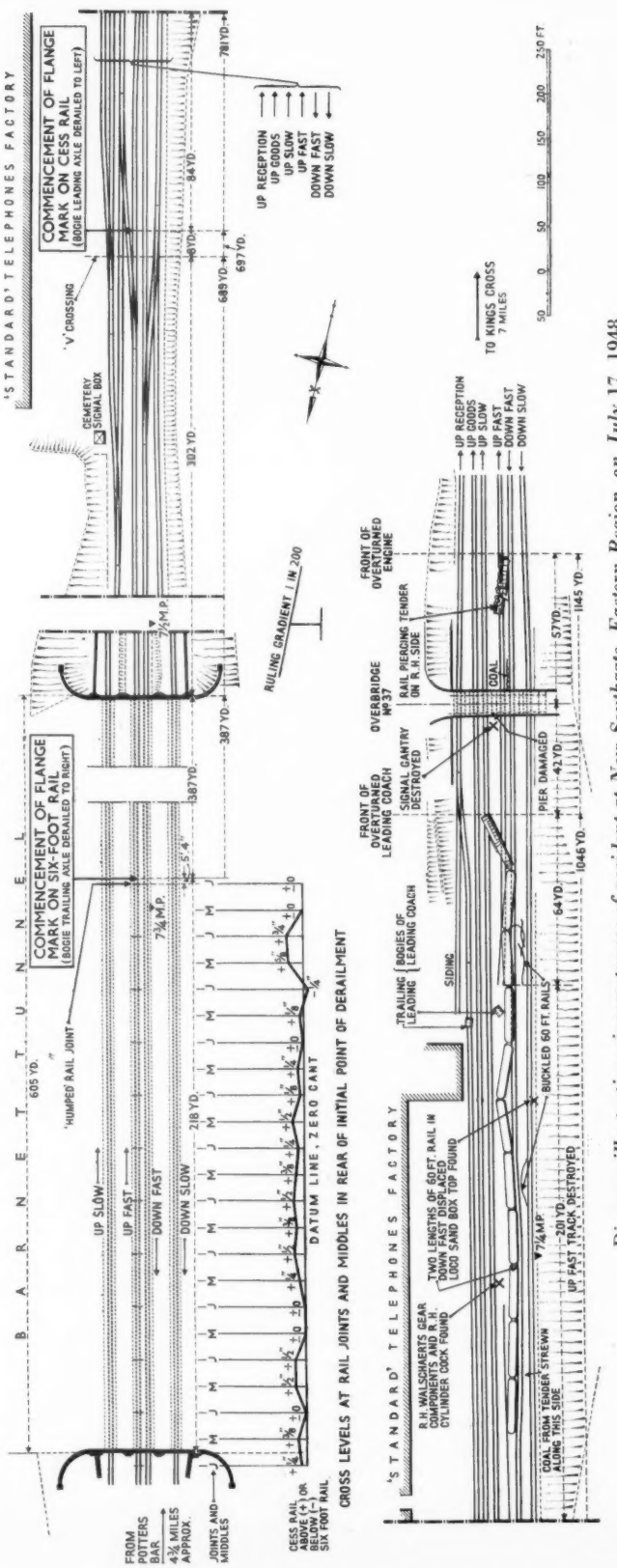


Diagram illustrating circumstances of accident at New Southgate, Eastern Region, on July 17, 1948

habit of packing joints too high. It would be right to leave one ½ in. high in a soft place, but not on solid foundation.

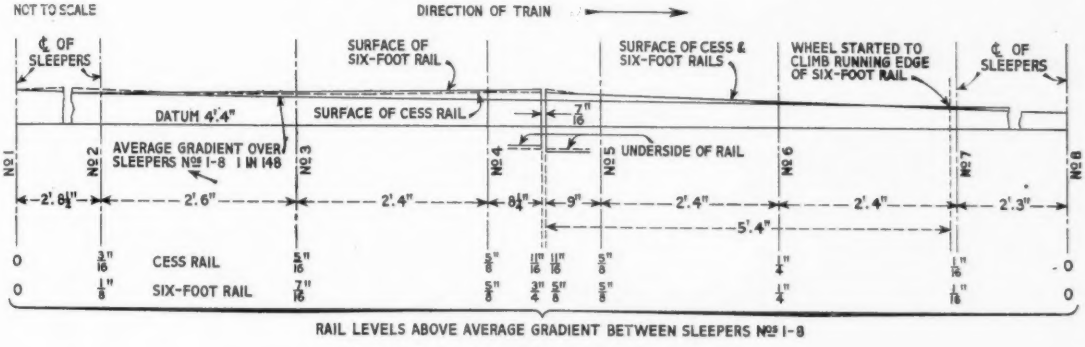
The inspector had travelled over the line on the footplate on June 17 and had been satisfied with the up fast line. The down needed some re-alignment. He was not present on July 11, but on July 14 again examined the down line. He paid no special attention to the up fast and had received no complaints about it since June 17. He could not explain the derailment and did not consider the high joint, as it was found, unsafe for 60 m.p.h., though undesirable on a fast line. No complaints of bad riding had been received since July 11, when it was lifted. The ganger, he considered, had acted correctly in leaving it high in a wet place; otherwise it would have gone down in a few hours and the work would have needed doing again.

necessary to derail did not occur until this train passed, running faster than usual.

Though possibly a more flexible bogie might have passed without derailment, it cannot be suggested that its design was a contributory cause, nor was there any contribution from the weakness of the broken spring. The leading axle remained on the rails until forcibly derailed at the crossing. Locomotive spring fractures have become more common in recent years throughout the country; this may be a reflection on the general condition of the permanent way.

Track material was sound and formation solid, but faulty adjustment resulted in two serious defects of level. The ganger had maintained his length conscientiously for the last 5 years, but his omission to make a careful superelevation gauge test the previous Sunday showed he had not attached sufficient importance, at any rate

Before such speeds can be resumed it also will be necessary to raise the standard of day-to-day maintenance. Length gangs in the London area, Kings Cross Engineering District, are still nearly 10 per cent. below normal total strength, and recruitment of suitable men is difficult for many reasons; it is hoped, nevertheless, that the position will improve, and that the material rehabilitation already accomplished will encourage a higher standard of work. A general limit of speed is a regrettable necessity in the meantime, but such restrictions, if long continued, may react undesirably on the staff and the impression may be formed that meticulous attention to line and level may not matter so much; in this case, there were defects on a good foundation which should not have existed in any main line and there was no margin of safety even at the moderately high speed of 70 m.p.h.. The driver probably was



Details of levels at high rail joint in tunnel

The Chief Permanent Way Inspector examined the line 2 hours after the accident and was present when Colonel Wilson inspected it. He did not consider the joint, although a trifle stiff, dangerous for 60 m.p.h. He reiterated this opinion, which he thought was justified by the many fast trains that had passed during the week, but later went so far as to say that the condition of the joint was very undesirable and should have been corrected without delay. He was not satisfied with the cross level. He did not think the irregularity would have been seriously disturbing for 60 m.p.h., but its correction would be essential for materially higher speeds. He did not wish to suggest that the 60 m.p.h. maximum justified any relaxation in maintenance.

Inspecting Officer's Conclusion

Colonel Wilson has no doubt that local track defects were the primary cause of the derailment, speed in excess of the authorised limit appearing to contribute to it. Apart from the weak spring mentioned, the engine was in normal condition.

Irregular cross level would set up some rolling, no doubt accentuating the slight alternations of flange pressure at the bogie wheels, such as ordinarily occur. Weight on the bogie would be increased as it rose to negotiate the high joint. The main frame also would be lifted and the rapid fall of rail level would then relieve the bogie of weight as the coupled wheels rose. The character of the flange mark suggested that the right trailing bogie wheel was very lightly loaded at the critical moment. Although the joint had been standing high for six days and been traversed by many fast trains, 33 hauled by "A2" class engines, probably the particular combination of flange thrust and relief of weight

in recent months, to the maintenance of regular cross-level on a fast running line.

A surprising error of judgment resulted in a sharply elevated joint, which had not become level as the ganger expected. He had evidently made an excessive allowance for the effect of water, leading him to pack much too high. His evidence was entirely straightforward, and Colonel Wilson particularly regrets the circumstances in which, on the eve of retirement, he must accept responsibility for the derailment.

The inspector cannot be criticised for concentrating on the down at the expense of the up fast, in the circumstances, but his evidence, and that of the Chief Inspector, suggested that neither, at first, was disposed to take a sufficiently serious view of the defect, and both thought the high joint should not have been unsafe at prevailing speeds. Colonel Wilson is confident that such an impression no longer exists and that they will direct their supervision to ensure an appropriate standard of maintenance.

Remarks

The general wartime restriction of 60 m.p.h. on the East Coast line was retained south of Hatfield, although in 1945 it was raised to 70 m.p.h. elsewhere. The reasons were the accumulated arrears of track renewals and arrears of drainage work in the clay formation in the London area, and shortage of permanent-way staff. Since that date, approximately 35 per cent. of the mileage of the fast lines south of Hatfield had been renewed, some of it with 110 lb. flat bottom rails; a considerable sum has been spent on drainage works, and much of the track material and foundation is back to its pre-war condition, which then justified considerably higher speeds.

exceeding the authorised speed, but he was not assisted by an indicator. Speed recorders, removed during the war, are being refitted to 4-6-2 type engines of the former L.N.E.R., and future policy in this respect is under consideration by the Railway Executive.

Long Rails in South Africa

(*Concluded from page* 154)

cost of installation and maintenance, in order to arrive at the economical length of a long rail for South African conditions. There is, of course, no theoretical limit to the length of a welded rail, but there are practical considerations, such as points and crossings, sharp curves, heavy gradients, transport of rails, (the longest rail transported in South Africa is 120 ft.), and removal of defective rails, particularly in case of accidents. Opening up of the track can be done only in short lengths and roughly at the same temperature at which the long rail was laid.

The advantages, which definitely outweigh the disadvantages, are lower cost of maintenance, particularly at joints; longer life due to elimination of rail batter and a consequent saving in renewals; smoother running top, resulting in saving on maintenance of track and rolling stock; greater comfort for passengers; elimination of creep; better conductivity for track circuits; and less track bonding on electrified lines.

In America it has been found that the cost of maintaining rail joints represents about 45 per cent. of the total track maintenance costs. Now that field welding has come into its own, it is quite obvious that the long rail has come to stay.

Problems of Nationalisation in Argentina

In an endeavour to cut heavy losses on the State-owned railways large increases in fares and rates are expected

Señor Jose Arrieta, Reuters correspondent in Buenos Aires, has reported that a request by the Argentine Government for the suspension of construction in Great Britain of 90 locomotives ordered for the Argentine railways has aroused considerable interest in Buenos Aires. The action is regarded as only one symptom of the problem which General Peron's administration took over when it purchased the railways from their British owners at a cost of £150,000,000.

Although it is less than a year since the management passed into Argentine hands, the new owners, states Señor Arrieta, have had their fair share of headaches. General Peron himself referred to this recently when he mentioned that one of Argentina's major drawbacks, in its programme of "economic independence," including the nationalisation of the railways, was its lack of experienced men. Previously, both he and Señor Miranda, President of the Economic Council, had stated that since taking over the railways, the Government had had to subsidise them at the rate of 1,300,000 pesos a day to keep them running.

A commission has been studying a general revision of passenger and freight tariffs with a view to bridging the gap of approximately 500 million pesos a year. Although it has been in session for several months, the commission has not yet produced a plan.

Passenger rates are expected to be approximately doubled, and Señor Miranda has said that carrying rates for cattle and agricultural produce will have to be increased greatly. It is thought, however, that the commission will heed the loud protests which such a course would raise, that this would merely worsen the already dwindling production of meat, grains, and other foodstuffs.

The independent journal *La Prensa* summed up the situation in a leading article published early this year, when it said: "Some time ago an order was introduced limiting to 30 kg. (about 66 lb.) the amount of baggage a passenger may take without charge. A Presidential decree of December 22 stated that any passenger taking an undue amount of baggage into a coach would be liable to a fine of 20 pesos, or two days' imprisonment, and would have to pay double the corresponding freight charge as well."

These and other measures taken by the new owners of the railways, the newspaper declared, "are part and parcel of the same harsh measures as that which calls for fines and imprisonment for passengers travelling without tickets, which has resulted in so many incidents, including two or three deaths." (One guard was thrown out of a moving train by a passenger whom he was trying to fine, while on another occasion two youths found travelling without tickets leapt from a moving train and fell under the wheels of another.)

"It had been hoped," continued *La Prensa*, "that State administration of the railways would result in better facilities for travellers than those offered by the private companies, but the contrary has proved the case." After saying that the "absurd situations arising from the application of unnecessarily strict regulations" would serve merely to favour the bus services which criss-cross the country, *La Prensa* voiced the following final complaint:—

"In Mar del Plata (the great summer resort), the railway employees have refused to hand over passengers' baggage to porters engaged by them. The delays and difficulties thus created can be imagined. It is true, also, that when a train reaches its destination at night, passengers cannot claim their baggage immediately, but must wait until the following day because the employees handling baggage do not work during the night hours."

Reuters correspondent concludes his report by mentioning that in the same edition *La Prensa* published photographs of long summer holiday queues outside the principal railway stations in Buenos Aires in an effort to draw attention to the general discomfort of railway travel in Argentina today.

Parliamentary Notes

Manchester Ship Canal Bill

The Manchester Ship Canal Bill was presented to the House of Lords on January 20, and read the first time.

British Transport Commission Bill

Petitions against the British Transport Commission Bill have been deposited in the House of Commons Private Bill Office by Uxbridge Urban District Council and Harrow Urban District Council.

Rhodesia Railways Limited (Pension Schemes & Contracts) Bill

The Rhodesia Railways Limited (Pension Schemes & Contracts) Bill was read a second time in the House of Lords on January 26 and referred to the examiners.

Railway & Canal Commission (Abolition) Bill

When the House of Commons considered in committee, on January 18, the Railway & Canal Commission (Abolition) Bill, the Attorney-General (Sir Hartley Shawcross) moved a new clause dealing with pensions for persons suffering loss of employment. He reminded the committee that on the second reading he had undertaken to put down, in committee, a new clause providing for the payment of a pension to the last surviving member of the court. That member was Lord Maenan, who had had a remarkably long record of public service in the courts of this country and in other fields.

Captain Peter Thorneycroft (Monmouth—C.) welcomed the clause as a valuable addition to the Bill.

Colonel Oliver Stanley (Bristol West—C.) said that, as an old member of the northern circuit, he was glad the Attorney-General had moved the new clause. Anyone who had practised on that circuit knew the great services rendered in a judicial capacity by Lord Maenan, and must feel glad that those services were being recognised by the House.

The clause was read a second time and added to the Bill.

The Bill, as amended, was reported to the House, passed the report stage, and was read the third time and passed.

The new clause provides that the Lord Chancellor may pay, out of moneys provided by Parliament, to or in respect of any person who suffers loss of employment in consequence of the abolition of the Commission, and as to whom the Lord Chancellor, with the approval of the Treasury, determines that such provision be made, such pension as he may so determine.

Transport in African Territories

Squadron-Leader E. Kinghorn (Great Yarmouth—Lab.) on the motion for the adjournment of the House of Commons on January 24, raised the subject of transport in the Colonies, particularly for East and Central Africa. He said they had found, since the groundnut scheme had been put into operation, that in Africa probably the greatest deficiency was in transport. If we were to develop the ports on that great Continent, we would have to go in for great expansion of railways and roads. After that, a great expansion of air transport would follow.

Colonel A. D. Dodds-Parker (Banbury—C.) asked whether it was premature to suggest that a conference be called with our Western Union allies who were concerned particularly with Africa south of the equator to see whether we could not produce some over-all plan for transport development. He believed the Portuguese as well as the Belgians were only too anxious to meet us and to have proper discussions on the immediate development of the transport system. He believed there were British firms which could undertake the building of railways and roads.

Mr. A. Edward Davies (Burslem—Lab.) asked whether the international organisations, the World Bank, the reconstruction organisations, which purported to take account of such problems, had been considered in relation to the matter.

Mr. A. M. Skeffington (Lewisham West—Lab.) inquired about the progress of the port of Mikindani and of the railway behind it.

Mr. D. R. Rees-Williams (Parliamentary Under-Secretary of State for the Colonies) said that the Colonial Office had considered communications and had decided that their object should be, in the first instance, to get an outlet from Central Africa and part of East Africa to the coast at Mikindani, and to join up the Central African railway with the East African system. It was considered essential, for strategic reasons and for economic reasons, to investigate the possibility of a link between those two systems.

Colonel S. G. Haughton (Antrim—C.) asked if they were of the same gauge.

Mr. Rees-Williams said they were not; the Central and Southern railways were 3 ft. 6 in. gauge, and the East African was metre gauge; but there was a long-term plan to convert the metre gauge, and they were not now buying any equipment not capable of conversion to 3 ft. 6 in. gauge. The length of the proposed link was slightly more than the distance between Paris and Warsaw.

The Secretary of State for the Colonies had called the attention of the African Governments to the question, and had given as his view the urgent desirability of having a survey made from Broken Hill in Northern Rhodesia to the central Tanganyika line and thence up to the Kenya & Uganda line. It was additionally unfortunate that, not only was there no connecting link between the Central African system and the Tanganyika system, but there was no link between the Tanganyika system and the Kenya system. If there were it would give them an outlet at three ports so far as traffic in Tanganyika was concerned, and they

would not have to concentrate on Dar-es-Salaam, but would have a spill-over at Momoasa and Tanga. The Secretary of State had decided it was essential to have a survey made from the east side of Lake Nyasa to Mikindani. That would develop the whole of Northern Nyasaland, and give access to the coal and other deposits in southern Tanganyika. The Secretary of State was concerned at the position of the port of Dar-es-Salaam, and wanted to be satisfied that all was being done to put the port in order, not only for the groundnut scheme, but for other traffic.

Colonel Dodds-Parker asked if that meant that the rail link from Broken Hill had second priority after the link across Lake Nyasa.

Mr. Rees-Williams replied that the investigations would go on at the same time. Personally, he thought the first portion of the railway to be built would be from the eastern side of the Lake of Mikindani. Other surveys would go on at the same time.

The Secretary of State had recently decided to call a conference of the interests involved, and it had been held in London in January, when the Ministries concerned had met representatives of the Governments of Kenya and Tanganyika and the East Africa High Commission. As a result, it had been decided that the surveys should be proceeded with, and the East Africa High Commission had decided in any case to link up the Tanganyika central line with the Kenya line, because it was felt it would have immediate economic return, which would necessarily not be the case with the Broken Hill line. It would also ease the strain on Dar-es-Salaam.

It had also been decided and confirmed that they should ask the United States for help with the supply of surveyors and survey teams. There had been a considerable amount of criticism about the engagement of the survey teams, but he thought there had been a complete misunderstanding on the point. It had never been intended that Dominion and British surveyors should be excluded, and they were making efforts to get as many adequately-qualified British and Dominion surveyors as they could.

Turning from rail to road transport, Mr. Rees-Williams said there was one great road, the great North Road from Broken Hill to Dondona and Nairobi and over to the Uganda border. At least a good part of that was supposed to be an all-weather road, but it was not what we in this country would regard as one, and it was not possible in all weathers to proceed along it with expedition. Because of that they had allocated £1,750,000 out of the Colonial Welfare & Development Fund for the improvement of the road, to try to make it as far as possible a real all-weather road.

There was no time to go into the question of Walvis Bay and Beira. The congestion at Beira caused considerable concern to the Colonial Office, as it did to the Portuguese authorities. The strain on the port was tremendous, but they were consulting with the Portuguese authorities to see what could be done. Walvis Bay did not come within the responsibilities of his department at all. Actually, the proposed route would not go through any Colonial territory. He understood, however, that the railway was not likely to be built in the immediate future, because, naturally, there was very little economic demand for it over a large part of the route.

The calling of a conference of Powers with African responsibilities on the whole question of transport in Africa was being considered. It was most desirable that African problems should be considered as a whole by the Powers responsible.

As regards the International Bank, they had already a Bill, which had passed its Second Reading, which dealt with loans from the bank; and matters under the Bill were now being discussed with the directors of the bank. He thought that, on the whole, the House would be satisfied that they were using every possible effort to make this great Continent of Africa what it should be, and to develop it in the way they all wished it to develop.

Questions in Parliament

Summer Time

Mr. J. Rankin (Tradeston—Lab.) asked the Lord President of the Council if he had any statement to make on summer time in 1949.

Mr. J. Chuter Ede (Secretary of State for the Home Department): I have been asked to reply. The Government proposes that summer time this year shall extend from April 3 to October 30. A draft of the Order in Council necessary under the Summer Time Act, 1947, will be laid before Parliament without delay.

Compensation to Nationalised Undertakings

Mr. G. B. Drayson (Skipton—C.) on January 24 asked the Minister of Transport, if he would give an assurance that compensation to road transport concerns was not governed by a sliding scale which gave greater benefits to large undertakings as compared with smaller firms.

Mr. Alfred Barnes: Yes.

Mr. Ernest Davies (Enfield—Lab.): Will the Minister also give an undertaking that in the event of the acquisition of these companies no more compensation will be given where they are acquired by negotiation than would be payable if they were compulsorily acquired under the Act?

Mr. Barnes: Complete accuracy cannot be determined, of course, if a business is acquired by voluntary agreement as against the process of arbitration which can be invoked, but nevertheless, as a general principle, I can give Mr. Davies that assurance.

Mr. Drayson: Is the Minister aware that there was general concern among the small hauliers, who felt that they would be discriminated against as compared with the larger concerns, and that his reply will give considerable satisfaction?

Rails for Russia

Mr. P. Piratin (Stepney, Mile End—Comm.) on January 18 asked the President of the Board of Trade how many tons of steel rails with the necessary fishplates, nuts, and bolts, had been delivered to the U.S.S.R., under the trade agreement of December, 1947; and when the complete order of 35,000 tons was likely to be delivered.

Mr. Harold Wilson (President of the Board of Trade): The total contracted for under article II of the agreement was 25,000 tons, not 35,000 tons. Of this quantity, I am informed that 22,480 tons of rails, together with appropriate accessories, have been delivered or are awaiting delivery. The remainder is due to be delivered very shortly.

Interzonal Railway Wagons in Germany

Lt.-Colonel Granville Sharp (Spen Valley—Lab.) on December 14 asked the Secretary of State for Foreign Affairs what reduction there had been during 1948 in the number of railway wagons owed by the U.S.S.R. to the British and American Zones of Germany; how many were now outstanding; and whether there had been any recent assurance that they would be returned.

Major C. P. Mayhew (Parliamentary Under-Secretary of State for Foreign Affairs), in a written answer, stated: The Soviet Zone net wagon debt to the Bizone has fallen by 2,000 wagons since December, 1947. At the present time the Soviet zone owes the Bizone a net total of 3,788 wagons. No recent assurance has been given by the Soviet authorities that wagons owing to the Bizone will be returned. On the contrary, Soviet transport authorities contend that inter-zonal records are inaccurate, and that the Soviet Zone does not owe wagons to the Bizone.

Northern Ireland Services

Sir Ronald Ross (Londonderry—C.) on January 24 asked the Minister of Transport, what was his policy as to the installation of radar aids to navigation in cross-channel ships on the routes between Great Britain and Northern Ireland.

Mr. Alfred Barnes: My policy is to encourage the fitting of marine radar apparatus, of a standard which will adequately serve the needs of navigation, in as many British ships as possible. Of the nine passenger ships in regular service between Great Britain and Northern Ireland, seven are already fitted and the other two will be fitted by the owners as soon as possible. All three of the ships which maintain a service for vehicles and their drivers between Preston and Larne also carry radar.

Sir Ronald Ross: Were the ships on the crossings to the Continent fitted before those referred to in the question?

Mr. Barnes: I really could not say. Sir Ronald Ross will have to put that question down if he requires an answer, but this appears to me to be a very good situation.

WEST COAST AIRWAYS (HOLDINGS) LIMITED.—At a recent extraordinary general meeting of West Coast Airways (Holdings) Limited a special resolution was passed to the effect that the company be wound up voluntarily, and that Mr. F. H. Jones, of the Railway Executive, London Midland Region, Accountant's Office, Euston Station, London, N.W.1, be appointed liquidator.

CANADIAN ROYAL COMMISSION ON TRANSPORT.—The Canadian Government has appointed a Royal Commission to examine and report on the country's transport services. Its appointment is a sequel to representations made to the Government that, by reason of economic, geographic, and other disadvantages, some sections of Canada are adversely affected by transport difficulties and by anomalies said to exist in the tariffs of tolls and rates. Although all transport services are likely to be brought under review, the Commission has been authorised particularly to examine the Railway Act as it affects the powers of the board which makes freight rate revisions and establishes competitive and international rates. The question of railway freight rates has long been a source of discontent, and, as recorded in our overseas columns, when an application for increased rates was made recently by the railways all the provinces except Quebec and Ontario submitted a brief to the Federal authorities which outlined their reasons for opposing the increase.

Notes and News

Estimator Required.—A mechanical engineer (estimator), with heavy engineering and foundry practice experience, and accustomed to handling large and small contracts, is required. See Official Notices on page 167.

Inspector of Works Required.—Applications are invited from qualified candidates for the post of inspector of works required by the Nigerian Government Railway (Capital Works), for one tour of 18 to 24 months in the first instance. See Official Notices on page 167.

Argentine Railways Purchasing Agency Limited.—At a recent extraordinary general meeting of the Argentine Railways Purchasing Agency Limited a special resolution was passed to the effect that the company be wound up voluntarily, and that Mr. H. J. Binder, of River Plate House, 12-13, South Place, London, Chartered Accountant, be appointed liquidator.

Steel Castings Film.—Representatives of the technical press were present at a showing of the film "A1 at Lloyds" at the Gaumont British Private Viewing Theatre, Wardour Street, on February 1. The film was produced by Mr. Edward Cook, of the Big Six Film Unit, for F. H. Lloyd & Co. Ltd., of James Bridge Steel Works, near Wednesbury, and depicts various processes concerned with the manufacture of steel castings. Considerable interest has been aroused by the film, both in this country and overseas, and special condensed versions have been made, with the explanatory commentary spoken in eleven languages.

Electric Motor Coaches for South Africa.—Further evidence of the valuable contribution to the export trade by British railway rolling stock manufacturers is provided by a shipment of motor coaches destined for the Reef electrified section of the South African Railways. This contract, which was for 54 coaches, was placed with the Metropolitan-Cammell Carriage & Wagon Co. Ltd., which firm sub-let 25 coaches to the Birmingham Railway Carriage & Wagon Co. Ltd., and the electrical equipment to the Metropolitan-Vickers Electrical Co. Ltd. The accompanying photograph shows part of a recent shipment from Birkenhead of 29 coaches—17 above deck and 12 below deck—on a Clan Line steamer.

New Carriages and Wagons for L.M.R.—In 1948 the London Midland Region of British Railways built 268 new railway carriages and 7,240 wagons. The number of carriages repaired by the Region was 6,778 and number of wagons 34,195.

Railway Students' Association Convention.—Arrangements are in preparation for the Railway Students' Association, London School of Economics & Political Science, 1949 Convention to be held in Glasgow from Friday, June 24, to Tuesday, June 28.

Institution of Railway Signal Engineers.—At a meeting of the Institution of Railway Signal Engineers, to be held at Chippenham, on March 2, Mr. E. E. Pierce will read a paper on: "Servicing of Railway Signalling Equipment." The meeting will be held at the Westinghouse Brake & Signal Co. Ltd., Chippenham works, commencing at 5.45 p.m.

London Transport Bus Map.—Several new features have been incorporated in the latest London Transport bus map, which is published in folder form and is available free to the public. The chief feature of the map is that all the central bus routes are shown on a true geographical scale; previously, because of the complexity of the problem, routes were shown by straight lines. A special section on an enlarged scale shows City and West End bus routes in greater detail, and Underground lines, a street index, and many country bus routes have been included.

Uruguayan Railway Repayments.—The directors of the Uruguayan railway companies announce that the agreement for the sale of the properties to the Uruguayan Government has been ratified in Montevideo and the purchase price of £7,150,000 paid to the companies in London. The companies concerned are the Central Uruguay Railway of Montevideo, Midland Uruguay Railway, Midland Uruguay Extension Railway, Uruguay Northern Railway, North Western of Uruguay Railway, and Quarahim International Bridge. They can now proceed to make the repayments of capital provided by the scheme of arrangement, sanctioned on October 21, 1948. It is expected that debenture stock repayments will be made early in April. Extra-ordinary general meetings have been convened for February 24, from 10.30 a.m. onwards, at River Plate House, Finsbury Circus, E.C., to consider resolutions to go into voluntary liquidation.

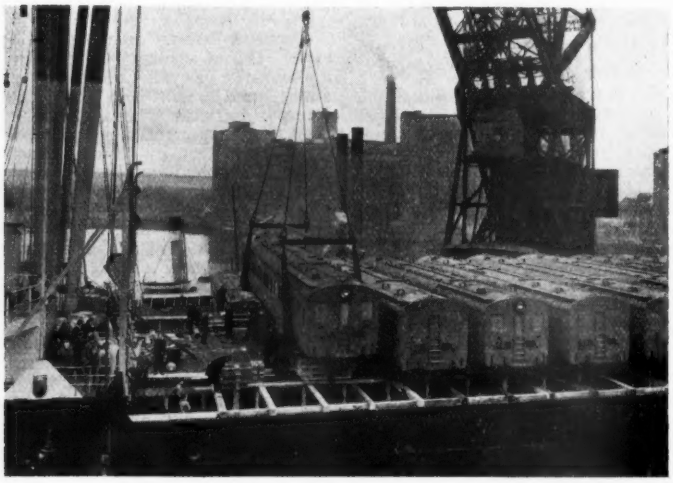
London Midland Region (London) Amateur Musical Society.—Some 80 railway staff are taking part in a production of "Chu Chin Chow," by the London Midland Region (London) Amateur Musical Society, which is being presented at the Scala Theatre, London, today, February 11, and tomorrow, February 12.

Railway Students' Association Dinner.—Arrangements have been made for the Railway Students' Association, London School of Economics & Political Science, dinner to be held on Tuesday, March 1, at the Charing Cross Hotel. Dinner will be served at 7 p.m., preceded by a reception of members and guests, at 6.30 p.m., by the President of the Association, Sir Cyril Hurcomb, Chairman of the British Transport Commission.

Transportation Centre, Royal Engineers.—The Transportation Centre, Royal Engineers, will hold its annual public day on Saturday, September 3, 1949. On that day, the Railway & Movements Wing at Longmoor will be open to inspection by the general public from 1.30 p.m. to 7.0 p.m., and all visitors will be welcome. In particular, it is hoped that, because this year the function is being held on a Saturday, many people who previously have been unable to get away in the middle of the week, will take the opportunity of visiting the Centre. Visitors will have an opportunity of seeing something of the training given to regular soldiers, supplementary reservists, and national servicemen in the Transportation Branch of the Corps of Royal Engineers, which covers all trades employed on railways, in ports, and on inland waterways. Arrangements are being made, also, to dedicate on Sunday, September 4, 1949, a stained-glass window in Longmoor Garrison Church in memory of the officers and men of Movements & Transportation who gave their lives in the recent war. Further notice of this ceremony will be given when arrangements have been completed.

London Transport Medical Offices.—On February 4, Lord Latham, accompanied by members of the London Transport Executive, opened the first of the divisional medical offices for London Transport at Manor House. Among those present were Mr. John Benstead, Deputy-Chairman, British Transport Commission, Sir Stewart Duke-Elder, Consulting Ophthalmologist to the Executive, officials of the Executive, and representatives of the trade unions. The opening of this office is a first step in a scheme for the decentralisation of the Medical Department designed to bring staff and doctors into closer working relationship. It is the intention of the Executive to provide a first-class modern industrial medical service for its staff. The medical treatment of the individual man, apart from emergency first-aid work, does not form part of such a service, because all treatment is carried out by the panel doctor or hospital under the National Health Service scheme. The new medical centre at

Electric Motor Coaches for South Africa



Loading 29 motor coaches at Birkenhead for the Reef electrified section of the South African Railways (see paragraph above)

OFFICIAL NOTICES

None of the vacancies on this page relates to a man between the ages of 18 and 50, inclusive, or a woman between the ages of 18 and 40, inclusive, unless he, or she, is excepted from the provisions of the Control of Engagement Order, 1947, or the vacancy is for employment excepted from the provisions of that Order.

TELECOMMUNICATION ENGINEER (44), A.I.E.E., M.I.R.S.E., 12 years senior Telecommunication Engineer on a group of South American Railways (7,000 miles), preceded by 12 years with large South American telephone operating company; fluent Spanish (spoken and written), wide experience in all branches of telephone and land-line telegraph engineering, including open-wire carrier systems, teleprinters, V.F. telegraphs and railway block and communications systems. Will shortly be open for engagement either at home or abroad.—Apply Box 274, *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

THE RAILWAY HANDBOOK provides the railway student with a collection of useful statistics and information relating to the railways of Great Britain and Ireland. In addition, in matters of international interest, such as speed and electrification progress, the book extends its scope to cover the whole world in order to present a complete picture of these increasingly-important developments. 120 pp. Dy. 8vo. Paper covers. *Price* 5*s*. *By post* 5*s*. 3*d*.

Crown Agents for the Colonies

APPLICATIONS from qualified candidates are invited for the following post:—

INSPECTOR OF WORKS required by Nigerian Government Railway (Capital Works), for one tour of 18 to 24 months in the first instance. Fixed salary according to age and experience between £600 and £800 a year, including expatriation pay. Outfit allowance £60. Free first class passages. Candidates, under 40, must have sound knowledge and experience of general building construction and be capable of setting out works and preparing requirements schedules from a plan. A knowledge of simple costing procedure, and ability to organise and control labour is essential. Apply at once by letter, stating age, whether married or single, and full particulars of qualifications and experience, and mentioning this paper, to the CROWN AGENTS FOR THE COLONIES, 4, Millbank, London, S.W.1, quoting M/N/24338/3D on both letter and envelope.

THE "PAGET" LOCOMOTIVE. Hitherto unpublished details of Sir Cecil Paget's heroic experiments. Eight single-acting cylinders with rotary valves. An application of the principles of the Willans central-valve engine to the steam locomotive. By James Clayton, M.B.E., M.I.Mech.E. Reprinted from *The Railway Gazette*, November 2, 1945. *Price* 2*s*. *Post free* 2*s*. 3*d*.

ESTIMATOR—sound Mechanical Engineer familiar with heavy engineering and foundry practice and accustomed to handling both large and small contracts. Some experience Railway P.W. work desirable but not essential. Required ultimately take charge estimating department.—Address Box 271, *The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

SECTIONED PERSPECTIVE VIEW OF LOCOMOTIVE FRONT END. A notable drawing of L.M.S.R. class "7P" 4-6-2 locomotive of the latest type. Reprinted from *The Railway Gazette*, June 15, 1945. *Price* 2*s*. 6*d*. *Post free* 2*s*. 8*d*.

RAILWAY MAINTENANCE PROBLEMS. By H. A. Hull (late District Engineer, L.M.S.R.). Valuable information. With much sound advice upon the upkeep of permanent way. Cloth, 8¼ in. by 5¼ in. 82 pp. Diagrams. 5*s*. *By post* 5*s*. 3*d*.

STANDARD MILITARY RAILWAY BRIDGES. By F. S. Bond. A description of the different types of bridges designed for rapid erection in the field by the Allied Forces, and of the various methods employed in such erection. 28 pages. 9 in. by 12 in.; fully illustrated. Paper cover, 5*s*. *By post* 5*s*. 2*d*.

Manor House includes a dressing-room, laboratory, X-ray section, eyesight testing room, consulting rooms, accommodation for records, and a waiting-room. It will serve approximately a quarter of the London Transport staff. It is planned in due course to open similar offices in other parts of the area.

Institute of Transport, Metropolitan Graduate & Student Society.—A paper entitled: "A History of Labour Conditions in the Transport Industry," will be read by Mr. A. R. Palser, before the Institute of Transport, Metropolitan Graduate & Student Society, on Tuesday, February 22. The meeting will be held at 80, Portland Place, London, W.1.

Fourth World Power Conference.—The Fourth World Power Conference will be held in London in July, 1950, and the theme will be "World Energy Resources and the Production of Power"; the dates selected are July 10-15. The headquarters of the conference will be in the building of the Institution of Civil Engineers. Sir Harold Hartley has accepted appointment as Chairman of the Conference, and as Chairman of the Organising Committee. Mr. C. H. Gray, Secretary of the International Executive Council of the World Power Conference, has been appointed General Secretary of the Fourth World Power Conference. Copies of the technical programme may be obtained on application to the General Secretary, Fourth World Power Conference, 201-2, Grand Buildings, Trafalgar Square, London, W.C.2.

Electric Motor Coaches for Indian Railways.—In our issue of January 28, which contained an article on the progress made in 1948 by the British electric traction industry, there was a reference to an order for 32 sets of electric motor coach equipment and 32 sets of trailer coach equipment for the G.I.P.R., placed with the English Electric Co. Ltd. Further information now is available. The main contractors for the order, which altogether comprises 56 motor coaches and 56 trailer coaches for the G.I.P.R. and the B.B.C.I.R., were the Metropolitan-Cammell Carriage & Wagon Co. Ltd. and the Birmingham Railway Carriage & Wagon Co. Ltd. respectively, electrical equipment for the coaches being sub-let as follows:—The English Electric Co. Ltd., 32 sets of motor coach and trailer equipments; British Thomson-Houston Co. Ltd., 24 sets of motor and trailer equipments.

Road Transport Executive, Midland Division.—The Road Transport Executive announces that the address of the Divisional Manager, Midland Division (Freight), has been changed to 30, Harborne Road, Edgbaston, Birmingham, 15.

Liverpool Overhead Traffics.—After an improvement by £223 to £2,995, in the first week of the current financial year, Liverpool Overhead Railway receipts have shown a series of small declines in subsequent weeks. During the week ended January 30, traffics were £2,751 and on the aggregate were £11,452, as compared with £11,400 for the corresponding period in 1948.

Melesco Society.—The Melesco Society (the technical association of the head office staff of the Superheater Co. Ltd.) held its inaugural meeting recently, when the programme included an address by the President, Mr. E. A. Robinson, on "The Story of The Superheater Company"; a talk on "Railway Motive Power," by Dr. Barwell, of the National Physical Laboratory; and films. The Society proposes to hold regular monthly meetings.

Double-Deck Coaches.—Speaking at a meeting of the Streatham Labour Party, on February 2, Mr. L. J. Callaghan, Parliamentary Secretary to the Ministry of Transport, said that an experimental double-deck railway carriage would be tried out by British Railways in South East London this year. The prototype was being built at Lancing and would increase the seating capacity of an eight-coach train from 840 to 1,016; passengers would step down from the platform into the lower deck of the coach. Reference to a proposed double-deck railway coach was made in our November 12, 1948, issue, in connection with a paper to the British Association, by Mr. O. V. Bulleid, Chief Mechanical Engineer, British Railways, Southern Region.

Terminal for South African Traffic at Southampton.—Plans have been made by the Southern Region of British Railways for the construction of a new terminal building at Southampton New Docks to handle Union-Castle Line vessels. This change is necessary because trade between South Africa and Southampton has developed to a marked degree with corresponding increases in the size of vessels and their carrying capacity. The latest additions to the Union-Castle fleet are the *Pretoria Castle* and the *Edinburgh Castle*, each of 28,800 tons, whereas in 1928 the average size of the vessels on this service was only 15,500 tons.

Broom & Wade.—Subject to audit the net profit of Broom & Wade Limited, before tax payment, for the twelve months ended September 30, 1948, amounted to £259,867, which is £60,399 less than last year. Final dividend on the ordinary capital is maintained at 15 per cent. and makes 22½ per cent. for the year.

Reduced Air Fares from Eire.—Fare reductions in flights from Dublin were announced by Aer Lingus on February 8. From April 1 excursion return fares from Dublin, 26 per cent. lower than last summer's rates, come into operation on Tuesdays, Wednesdays, and Thursdays. They will be: London, £11; Liverpool, £6 6s.; Manchester, £6 12s.; and Glasgow, £7. Ordinary return fare to London will be £13 10s., a 9 per cent. reduction.

Ulster Transport Authority.—According to a traffic return issued on January 28, receipts of the Ulster Transport Authority for the week ended January 23 and the equivalent period last year were as follows:—

	1949	1948
Passenger	£50,816	£42,113
Goods	£26,500	£20,261
Total	£77,316	£62,374

The aggregate receipts for 16 weeks to date were:—

	1949	1948
Passenger	£853,147	£720,070
Goods	£420,097	£371,792
Total	£1,273,244	£1,091,862

Stephenson Locomotive Society.—On February 7, members of the Stephenson Locomotive Society heard a paper by Dr. W. A. Tuplin on: "The Churchward Engines of the G.W.R.," at the society's Kensington headquarters. Apart from presenting a comprehensive account of Great Western locomotive development under G. J. Churchward, Dr. Tuplin's paper contained a wealth of comment on various features of his designs. Church-

ward's ability to adapt ideas from abroad in his efforts to produce suitable basic designs for standardisation was amply illustrated and a number of interesting details were given concerning the history of the De Glehn Compounds on the G.W.R. and the first British Pacific, *Great Bear*.

Railway Union Piecework Claim Rejected.—The claim by the N.U.R. in respect of rates of pay for pieceworkers in railway workshops has been turned down by the National Arbitration Tribunal. This dispute arose over the interpretation of a reference to adjustments in an agreement of last May for an increase of 4s. in the basic rates, and the N.U.R. case was that the method of adjustment would not benefit higher rated workers. Though at one stage employers offered a compromise to adjust prices to give an additional 2s. to all craftsmen who would not benefit, and although the Confederation of Shipbuilding & Engineering Unions agreed to this, the offer was rejected by the N.U.R., and then withdrawn by the employers. Now the N.A.T. has confirmed the Railway Executive interpretation of the agreement.

Forthcoming Meetings

February 11 (*Fri.*).—Institute of Transport, East Midlands Section, at the School of Transport, Derby, at 6.30 p.m. "The London Underground Railway System," by Mr. R. C. Hider.

February 11 (*Fri.*).—Institute of Transport, Northern Section, at the Royal Turks Head Hotel, Newcastle, at 7 p.m. "The North Eastern Region of British Railways in 1948," by Mr. C. P. Hopkins, Chief Regional Officer, North Eastern Region.

February 12 (*Sat.*).—British Railways, Southern Region, Lecture & Debating Society; visit to Tilmanstone colliery.

February 16 (*Wed.*).—Institution of Locomotive Engineers, at the Institution of Mechanical Engineers, Storey's Gate, London, S.W.1, at 5.30 p.m. "American Locomotive Practice, 1948," by Mr. D. Patrick.

February 16 (*Wed.*).—Institution of Railway Signal Engineers at the Institution of Electrical Engineers, Savoy Place, London, W.C.2, at 6 p.m. "Relays and Standardisation," by Mr. J. P. Coley.

February 16 (*Wed.*).—Railway Students' Association, London School of Economics & Political Science; visit to *The Daily Graphic* and *The Sunday Graphic*, Kemsley House, London, W.C.1, at 8.30 p.m.

February 17 (*Thu.*).—Diesel Engine Users Association, at Caxton Hall, Westminster, London, S.W.1, at 2.30 p.m. Informal discussion on: "Operating Problems."

February 17 (*Thu.*).—British Railways, Western Region, London Lecture & Debating Society, at the Clerks' Dining Club, Bishop's Bridge Road, Paddington at 5.45 p.m. "Gas Jets and Gas Turbines for Railway Traction," by Mr. A. W. J. Dymond, Assistant to Chief Mechanical Engineer, Western Region.

February 17 (*Thu.*).—Institution of Electrical Engineers, Savoy Place, London, W.C.2, at 5.30 p.m. "Railway Traction Control Equipment on Suburban London Transport," by Mr. E. Webster.

Railway Stock Market

Stock markets opened the week with heavy declines in oils, copper, and base metal shares, together with a reaction in leading industrials, talk in America of further falls in commodity prices taking markets by surprise. At the time of writing, falls in oil shares have ranged down to 5s., those in copper down to 7s. 6d., and leading industrials such as Imperial Chemical, Turner & Newall, and Dunlop Rubber, were 1s. lower in some cases. In contrast gold mining shares rallied strongly.

British Funds have been relatively steady, and foreign rails were little changed, apart from Brazilian stocks, which continued to fluctuate on conflicting views of possible take-over developments. British Funds were again featured by firmness of long-dated stocks. There was a good deal of switching into the latter from short-dated issues such as National War Bonds (1949-51). Consols and Treasury 2½ per cents. were again favoured with Transport 3 per cents. (1978-88) steady at 101⅛. The view persists that every effort will be made to make British Gas stock longer dated than existing nationalisation stocks, bearing in mind the important conversion or repayment operations which will have to be carried out in the gilt-edged market next August and in February of next year, which will be followed if all goes according to plan by the issue of some £300 million of British Steel stock on May 1, 1950.

Among Brazil rails, Great Western of Brazil, after a sharp advance, reacted to 112s. 6d. on fears that it might not be until 1950 that compensation would be received, even in the event of Brazil agreeing to take over the railway. Leopoldina also receded, the ordinary to 10, the preference stock to 36½, the 4 per cent. debentures to 85¼, and Leopoldina Terminal 5 per cent. debentures to 80. San Paulo came back to 155. Where changed, Uruguayan rail stocks have moved in favour of holders, but in most cases they are a restricted market, awaiting the compensation pay-out. In other directions La Guaira Caracas 5 per cent. debentures have marked 66½. Antofagasta at 9½ and the preference stock at 57½ have been steady. Beira Railway bearer shares were 45s. 9d. Canadian Pacifics at 22 reflected the set-back in dollar stocks. Mexican Railway 6 per cent. debentures at 87½ moved higher on balance. United of Havana 1906 debentures have been steady at 13¼.

Movements in road transport shares were mainly small. Scottish Motor Traction continued to change hands around 105s., and Bristol Trams were 92s., but B.E.T. stock, after strengthening at the close of last week, reflected the general market trend, receding to £1,880 at the time of writing. Tillings have been firm around 125s. Report and accounts of Thomas Tilling, likely to be issued in a few weeks, will give a clearer picture of the value of the remaining non-transport assets. The market view is that Tillings are probably worth 130s., including the £5 return to be made as a result of the deal with British Transport.

Colliery shares have been prominent. Allocations for Scotland and Wales are in excess of most market expectations, but those for the Midland areas are slighly disappointing, upsetting market estimates of break-up values. It is difficult to assess the latter because in addition to the district awards there is cash compensation to be received for ancillary assets.

Reprieve of their non-steel-producing assets from nationalisation helped Guest Keen, which strengthened to 50s., and Staveley, which improved to 90s. 6d. Shares of locomotive builders and engineers moved narrowly. Bever Peacock were 24s 1½d., North British Locomotive 23s. 9d., and Vulcan Foundry 26s. 6d., while Gloucester Wagon receded to 58s. 9d. Charles Roberts changed hands around £7 and Wagon Repairs 5s. shares marked 21s. 6d.

Traffic Table of Overseas and Foreign Railways

	Railways	Miles open	Week ended	Traffics for week: Total this year	Traffics for week: inc. or dec. compared with 1947/48	No. of week	Aggregate traffics to date: Total 1948/9	Aggregate traffics to date: Increase or decrease
South & Central America	Antofagasta... ...	811	30.1.49	£ 66,910	+ £ 9,470	4	£ 315,620	+ £ 67,340
	Bolivar	174	July, 1948	$28,960	− $69,357	30	$471,287	− $301,893
	Brazil	—	—	—	—	—	—	—
	Cent. Uruguay ...	970	6.11.48	32,712	+ 2,978	18	593,105	− 7,652
	Costa Rica	281	Dec., 1948	34,398	− 974	26	214,237	+ 16,518
	Dorada	70	Dec., 1948	32,515	+ 6,915	52	338,423	− 12,377
	G.W. of Brazil ...	1,040	29.1.49	42,100	− 800	4	168,500	− 17,200
	Inter. Ctl. Amer. ...	794	Dec., 1948	$1,168,700	+ $45,700	52	$13,333,950	+ $257,513
	La Guaira	22¾	Jan., 1949	$110,296	+ $32,218	4	$110,296	+ $32,218
	Leopoldina	1,920	22.1.49	50,443	− 8,758	3	153,237	− 31,534
	Midland Uruguay ...	319	Sept., 1948	19,608	+ 3,123	12	67,355	+ 16,721
	Nitrate	382	31.1.49	15,188	+ 5,771	4	30,253	+ 7,150
	N.W. of Uruguay ...	113	Sept., 1948	5,686	− 1,213	12	16,335	+ 1,989
	Paraguay Cent. ...	274	28.1.49	£102,796	+ £45,638	30	£3,132,601	+ £1,152,988
	Peru Corp. ...	1,059	Jan., 1949	223,166	+ 42,592	31	1,383,296	+ 176,604
	Salvador	100	Nov., 1948	c180,000	+ c24,000	22	c509,000	+ c37,400
	San Paulo	153½	—	—	—	—	—	—
	Taltal	156	Dec., 1948	8,900	+ 510	26	47,420	+ 6,680
	United of Havana ...	1,301	29.1.49	$236,326	− $241,569	30	$6,468,979	− $2,668,677
	Uruguay Northern	73	Sept., 1948	1,072	+ 52	12	3,308	+ 111
Canada	Canadian National...	23,473	Dec., 1948	11,254,987	+ 1,630,242	52	122,817,487	+ 13,267,992
	Canadian Pacific ...	17,037	Dec., 1948	7,769,250	+ 618,000	52	88,812,250	+ 9,165,750
Various	Barsi Light* ...	202	31.12.48	25,875	+ 277	39	246,667	+ 20,355
	Beira	204	Nov., 1948	128,810	+ 18,938	9	255,148	+ 29,260
	Egyptian Delta ...	607	20.12.48	23,669	+ 2,203	38	532,935	+ 109,048
	Gold Coast ...	536	Nov., 1948	246,162	+ 84,582	35	1,648,016	+ 459,522
	Manila	—	—	—	—	—	—	—
	Mid. of W. Australia	277	Nov., 1948	30,031	+ 10,295	22	143,744	+ 35,685
	Nigeria	1,900	Nov., 1948	495,323	+ 70,029	33	3,647,496	+ 716,766
	Rhodesia	2,445	Sept., 1947	643,980	+ 102,833	52	6,787,603	+ 612,938
	South Africa ...	13,347	15.1.49	1,380,223	+ 63,489	42	55,704,538	+ 3,452,080
	Victoria	4,774	June, 1948	1,358,791	+ 248,144	52	—	—

*Receipts are calculated @ 1s. 6d. to the rupee